Chapter 15
The Place of Cocoa and Coconut Cultivation in Family Plantations in Peninsular Malaysia

Pierre Dupraz and Murielle Morisson

The Malaysian cocoa cultivation cycle was one of the fastest and shortest in history. Starting with a yield of less than 1,000 tonnes in the early 1960s, Malaysian cocoa output vaulted to a level of 200,000 to 220,000 tonnes between 1987 and 1993, before collapsing to a plateau of 30,000 tonnes in the 2000s. Large company- and individual-owned plantations played a major role in this process. Nevertheless, the participation of family farms in the cocoa cycle, and what cocoa cultivation represented for these family farms at one time is very instructive. The areas planted with cocoa in smallholdings increased from 8,000 to 35,000 ha between the 1970s and the 1990s. Cocoa became the diversification crop for the oldest systems mainly because of its skyrocketing price in the international markets in the early 1970s. A steep decline in cocoa prices 20 years later, in the early 1990s, led to a second stage of diversification when farmers progressively abandoned cocoa.

This chapter examines a scenario in which cocoa cultivation became financially attractive, prior to being abandoned. We find here the guiding hypothesis of this book: diversification mainly stems from ecological changes, the circumstances of the unfolding of the cocoa cycle, with the start of aging of cocoa orchards and the difficulties of their replanting. The study looks at the 1970–1990 period, when existing systems were transformed by the adoption of cocoa. The enthusiasm for cocoa cultivation, starting in the 1970s, was accompanied by a great diversity of agricultural situations. Cocoa, as tree-capital, was a source of income and contributed to social transformation in Malaysia in different ways in different regions.

Malaysia has undergone dramatic changes following its independence in 1957. We will present an overview of these social and political transformations and discuss how they, in conjunction with prices, influenced farmers to adopt cocoa cultivation.

P. Dupraz (✉)
INRA, UMR 1302 Smart, 35 000, Rennes, France
e-mail: pierre.dupraz@rennes.inra.fr

P. Dupraz
Agrocampus Ouest, UMR 1302 Smart, 35 000, Rennes, France

M. Morisson
18 Avenue Pasteur, 78 580 Maule, France
e-mail: mmorisson@gmail.com

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This chapter examines diversification in three villages in three different regions of peninsular Malaysia, starting with Pamah Kulat in Pahang state. This diversification is representative of an extension of cocoa cultivation on cleared forest lands, on the hills and mountains in the centre of the peninsula. This cocoa trend was similar, at least initially, to that seen in other cocoa-producing countries, especially in West Africa.

We must remember, however, that the pioneer cocoa cultivation in Malaysia is secondary to a specific cultivation system common in this country: the intercropping of cocoa in the understory of coconut trees, especially along the peninsula's western coast. The history of human settlements and agriculture in this region dates back over a 100 years. Using the typology of the farmers in the two villages of Sungai Batang and Parit Haji Abdul Salam, we will attempt to address the issues of cocoa cultivation in this part of Malaysia.

15.1 Methodology

The aim of this study was to understand the economic role of cocoa cultivation in small Malaysian plantations. In Malaysia, small plantations are defined as those farming less than 40 ha. They are usually family farms, as opposed to large commercial plantations whose structure and management were inherited from the colonial period.

A preliminary phase of the study involved retracing the history and financial details of the introduction of cocoa in Malaysia, including:

- the role of the macroeconomic context and prices;
- the role of policies for agricultural development and poverty eradication;
- the role of public and private research, development and marketing organizations.

This phase was based on a review of the literature and interactions with various researchers, development officials, village heads and traders of agricultural products ranging from collectors to exporters. This analysis allowed us to ascertain the initial characteristics of the Malaysian cocoa boom of the 1980s. In comparison to Africa, the soil and climate conditions, expertise and quality of the beans here were worse. However, its effective and efficient collection and marketing systems—largely controlled by private operators—explain Malaysian competitiveness to a large extent. In fact, Malaysian cocoa farmers received nearly 90 % of the international cocoa price, while their Cameroonian counterparts obtained less than 50 % during the same period.

The main part of the study focuses on the economic behaviour of smallholders and how they formed part of the local economy, the labour market and, in particular, the agricultural land market. The analytical framework is based on a farmer life-cycle hypothesis. According to this hypothesis, in our context, the farmer anticipates and prioritizes his consumption needs over his entire adult life. He

considers income opportunities related to his work as an employee, and then as a farmer once he inherits or purchases land. Finally, he factors in the efforts to save money necessary to accumulate capital that will ensure sufficient income in his old age. The relevance of this hypothesis, however, became only gradually apparent during the initial surveys. In fact, the villagers and farmers did not have any system for retirement pensions, nor any long-term bank savings or credit facilities. Furthermore, the oldest amongst them attached great importance to the maintenance of a young labour force in the village. Thus, agricultural assets such as land, trees and livestock played a crucial role, not only in terms of production but also as assets to pass on to the next generation.

This chapter's first part is based also on a systematic survey of about 60 family farmers. This survey included some landless rural families from two villages on the west coast: Sungai Batang in Perak state and Parit Haji Abdul Salam in Johor state. In addition, some villagers employed by the non-agricultural public and private sectors were also interviewed in an attempt to understand how access to non-agricultural income and an institutional retirement system could upset the economic performance and the economy of the entire village. This is the case of Parit Haji Abdul Salam which, unlike Sungai Batang, is located close to an industrial development zone. The sampling, with no claims to representativeness, focused on describing the diversity of professional and family situations. In accordance with the life-cycle hypothesis, the survey focused on describing household size and composition, monetary savings and debt, use of family labour, revenue structure, and composition of capital and its evolution over time.

The second part explores the economic performance of different agricultural products. For each family surveyed, the goal was to reconstruct the family budget in terms of money and work time, as well as to analyze investments, costs, work time and the income from each crop. Fishing and home consumption of food products (shrimp, cockles, fruits, roots and tubers) cannot be ignored for low-income households, but these were not addressed in detail due to lack of time. Interviews lasted between 1.5 and 2.5 h. In Sungai Batang, a second survey was conducted on a dozen individuals to correct identified accounting inconsistencies.

15.2 Results and Discussion

15.2.1 Cocoa in a Rapidly Developing Area: The Pahang Region

15.2.1.1 Clearing of the Forest

Cocoa cultivation is characterized by the planting of cocoa on cleared forest land and in various crop associations. The historical development of farming systems has changed the conditions under which cocoa is cultivated and its role in cropping systems. The Pahang region is characterized by hilly terrain and significant forest

cover. The potential of arable land is high: of a total of 23 million hectares of land, some 0.75 million hectares are suitable for agriculture, of which only 0.2 million hectares are currently in use. The district of Raub has good infrastructure despite the fact that it has little industrial development. All agricultural activities are carried out in small village farms. Rice fields are found in the lowlands, while the slopes are covered with rubber trees. These rice fields are generally managed by women with production destined mainly for home consumption. Rice is processed in artisanal village processing plants. Despite government efforts to help farmers obtain two crops instead of one a year, rice cultivation has been losing steam since 1965.

Farmers believe that large scale clearing of forest land has had an adverse impact on water availability in some plots. In addition, young rural people do not want to work in the paddy fields. In 2012, only one rice processing plant remained functional, and this too operated only twice a week. Paddy fields located around homes were converted to orchards by the end of the 1960s; this was made possible largely due to the distribution of fruit tree saplings by the government. Just like rice, rubber cultivation too faced a labour shortage, with land owners finding it difficult to get workers to tap rubber trees. In fact, casual labourers had several alternatives available to them: either work in industries in the city, find employment in a Felda plantation[1] (which would require them to leave the village), or even acquire land in the village itself.

To summarize, even before the advent of cocoa cultivation, farmers were cultivating rice but only sufficient to help meet their own home consumption requirements. However, they were already diversifying their crops to overcome problems of unpredictable labour availability for rubber cultivation.

15.2.1.2 Cocoa, an Additional Opportunity

In the early 1980s, cocoa was introduced on the government's initiative by the Malaysia Agricultural Research and Development Institute (Mardi). The political machinery within the villages then helped farmers undertake cocoa cultivation. Several economic factors made this possible.

A Rapid but Controlled Colonization of the Land

New areas, especially former government reserves, were opened up through a controlled redistribution by the State. This increase in arable land surface was, however, at the expense of the forest. In addition, the low price of land, about 50 times cheaper than on the west coast, allowed families to accumulate landholdings.

[1]Felda Global Ventures is a large industrial group which manages more than 450,000 ha of plantation estates in Malaysia.

This opportunity to acquire land also attracted many young people from the west coast, where there was not enough land to go around.

An Agriculture Oriented Towards Diversification and Intercropping

Diversification helped farmers reduce risks related to fruit price fluctuations in the market, and the lack of regular labour to tap rubber. Cocoa thus seemed to be an added opportunity for diversification, rather than the principal crop. Since cocoa production depended mainly on family labour, the success of cocoa was assured even in a scenario of limited availability of casual labour.

Cocoa was initially intercropped with banana and fruit trees. Banana trees provided shade for young cocoa plants even as they ensured a steady income, while the farmer awaited the entry into production of cocoa from the second year onwards. Banana trees were removed after 4 years, when cocoa trees became tall. *Gliricidia* then provided shade, until such a time when fruit trees began providing it.

Forest Rent Favourable to Cocoa Production

Plantations established on cleared forest plots enjoyed several advantages. All the benefits derived from forest rent described in West Africa (Ruf 1987) could be found here. Requirement for inputs were lower than for land that was already cultivated. Cocoa trees growing in the ecological conditions prevalent in Pahang produced a harvest at the end of 2 years. Cocoa thus evinced greater interest than did rubber. Yields for cocoa grown in this region were much higher (3–4 times) than on the west coast of Malaysia, with cocoa planted in the understory of coconut trees.

A Highly Subsidized and Therefore Increasingly Attractive Region

In order to assert control over new lands made available by the State for agriculture, sectoral agricultural development agencies tried to one-up each other by offering subsidised inputs and technical support. In this way, they hoped to get farmers to grow the crop over which they had responsibility. In the Raub area, for example, this mainly resulted in a competition over the development of new lands and abandoned rice fields between the Rubber Industry Smallholders Development Authority (Risda), wanting to extend rubber plantations, and Mardi, which wanted to increase the areas under cocoa cultivation.

In this region, home consumption was high and production costs were low. Farming households were engaged in increasing their savings and endeavoured to acquire new forest plots that they could clear. It was also obvious that the pace of economic and demographic growth depended on the rate at which the government released forest lands for agriculture.

15.2.2 Smallholders on the West Coast

The western coast of peninsular Malaysia is a flat area with alluvial soils. The vegetation consists of perennial crops such as rubber, oil palm and coconut. Coconuts were cultivated mainly smallholders of Javanese origin in the two villages studied. The British colonial administration had encouraged their immigration to this region in the early 20th century. They demarcated out village lands and assigned plots to the immigrants. In this way, the British hoped to develop a dynamic rural paddy cultivation system that could feed workers of the tin mine and the large commercial plantations estates that were in full expansion.

However, problems of water availability and markets turned farmers away from growing rice. Coconut plantations emerged as a compromise between the desire of farmers to become part of profitable agricultural sectors (for example, rubber) and the government's wish to restrict them to growing food. In fact, in Malaysia, from the time of colonization to the present, the status of land was linked to the main crop grown on it. Consequently, the choice of the basic crop depended on the government. Farmers thus sought to avoid any competition with large farms, which mainly grew rubber.

15.2.3 Social Aspects of the Introduction of Cocoa

The technical modalities of the introduction of cocoa cultivation, as well as the role of this crop in the coconut-based farms, varied considerably. They were part of an evolution of family farms, and were subject to demographic and macroeconomic constraints. This diversity of agronomic and social factors as they pertained to cocoa cultivation can be understood through a typology of the farmers' productive behaviours.

Smallholder coconut plantations are categorized based on a demographic determinism dating back to colonial times. In the early 20th century, the colonial British government distributed land among farmers, large plantations and the State. This land distribution was not subjected to any review following the country's independence. Indonesian migrants quickly populated the west coast and cleared the entire area reserved for ethnic Malay farmers. A population explosion in this limited land area resulted in a decrease in the per-capita arable surface. The size of family farms decreased as a result of egalitarian rules of land inheritance. Due to the rural exodus, this trend is now being challenged. The main macroeconomic determinants are summarized in Box 15.1.

Box 15.1. Major social and economic events that explain crop diversification in Malaysia in the 1960–1990 period

1960–1970

- GDP growth of 6 %.
- Diversification of major rubber plantations to oil palm, which became a major competitor of copra.

- First downstream industrialization in the agricultural sectors.
- 1969: Race riots. This social crisis led to the implementation of the New Economic Policy (NEP) based on a programme for the eradication of poverty and social restructuring that favoured ethnic Malays. This resulted in numerous subsidy programmes for smallholdings and an improvement of rural infrastructure.

1970–1980

- GDP growth of 7.8 %.
- Fall in the purchasing power of copra.
- The two main driving principles of the NEP encouraged a professional and geographical exodus from old rural areas, mainly from coconut plantations.
- Setting up of labour-intensive industries (textiles and electronic components).
- Felda accelerates its policy of setting up smallholdings within its schemes (1976–1977) in the context of very high cocoa prices: MYR 8/kg of dry beans, i.e., USD 2.6/kg (1 Malaysian Ringgit (MYR) = 0.37 USD).
- Massive expansion of cocoa plantations.

1980–1990

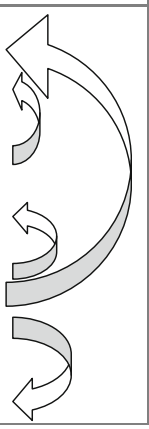
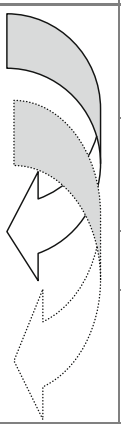
- 1985–1986. The country recorded a negative economic growth as a result of a concomitant decrease in the price of most Malaysian export products.
- Continued decline of cocoa prices.
- November 1989: MYR 2/kg of dry beans, i.e., USD 0.7/kg.
- January 1990: MYR 1.80/kg of dry beans, i.e., USD 0.6/kg.

The role played by coconut plantations in the social organization of villages in the early 1970s was still relevant in 1990 in one of two villages studied despite, or rather because of, the introduction of cocoa cultivation. Rural coconut plantations were the main reason for an exchange of labour between families and farms. It provided an income to villagers belonging to different social classes:

- Landowners who sold coconuts or copra to traders;
- Daily wage or casual labourers in the agricultural sector who offered their services during coconut harvests. This strenuous work can only be undertaken by villagers who are between 20 and 50 years old;
- Chinese or Malay traders who collected the nuts and copra and sold them to the outside world.

This relationship of the coconut between this social role and the one it fulfils in family farms can be elicited by using the life-cycle concept. It allows village farmers to be divided into four groups based on their resources, family constraints

Table 15.1 Coconut plantations in the village life cycle and social organization in Malaysia

Age of the head of the family	Level of fixed expenses (food and schooling)	Income sources	Flow of work	Flow of coconut plantation asset	Purpose of monetary savings
Old: type I	Low	Profits obtained from ownership of the coconut plantation			Pilgrimage
Middle-aged: type II	High	Profits from coconut plantation and casual labour			Coconut plantation
Young: type III	Low	Casual labour			Coconut plantation
Entrepreneur 'not part of the life cycle': type IV	Variable	Profits from several activities			Various profitable investments

and interdependencies. These groups constituted the analytical framework which helped explain the different productive behaviours presented in Table 15.1.

Modigliani (1980) defines, in a neoclassical framework, the concept of an individual's life cycle in its simplest form. This approach is based on an inter-temporal utility function ordering the various 'consumptions' by the individual during his lifetime according to his preferences. The reference individual, for our purposes, is the head of the family. Given his intertemporal preferences, the head of the family adjusts savings and indebtedness according to his income opportunities. These latter depend on his capacity for work and capital. This should allow him to tailor his resources in the most efficient manner to the desired consumption level at each phase of his life cycle.

The Modigliani (1966) life cycle is illustrated in a very simplified manner in Fig. 15.1. An individual is termed as an economic agent when his income from his work reaches a level Y and enables him to meet his needs C. This income Y(T) is constant over a period T up to the age N and his consumption C(T) is constant until his death at age L, which is greater than N. There is no uncertainty about or any transmission of his wealth. In order to achieve his goal, the individual must put money away (savings) during his active working life (T between 0 and N) to maintain his consumption level during his inactive period by drawing on his accumulated wealth (decapitalization). His wealth A(T), which was initially zero, increases until the age N when it peaks, and then returns to 0 at age L. This pattern can be adapted to different consumption rates and income opportunities.

To take the reality of Malaysian family life into account, we have to understand that this desired consumption level varies over an individual's life. It is defined here

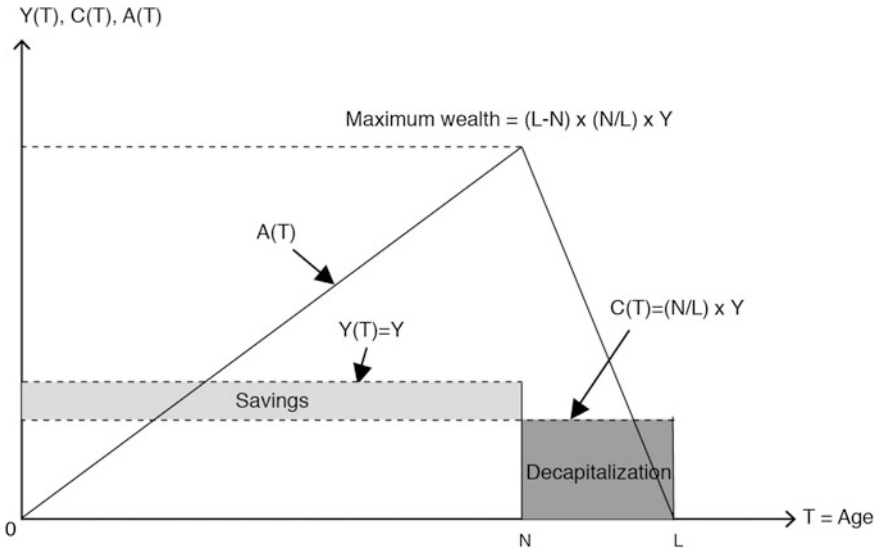


Fig. 15.1 The farmer life-cycle hypothesis and the requirement for capital (*source* Modigliani 1966)

by the stage of development of the family. This concept is adapted from Chayanov (1966). When the basic unit is the nuclear family, it is subject to an internal biological determinism. This determinism is expressed by the number of children—which initially increases and then decreases with the age of the family head—who he must feed and educate. Such food and educational needs are called incompressible needs; the head of the family can predict these needs over the long term. If the nuclear family is also the unit of production, the amount and nature of work done by the head of the family also depends on his age. Similarly, they constitute an internal biological determinism which raises issues of the subsistence of elderly people, whose ability to work shrinks faster than their incompressible needs.

We can thus categorize villagers into different groups, depending on their current life-cycle phase. This categorization of farmers in relation to age necessitates a prior differentiation between farms. In fact, it is important to distinguish between farms whose main source of income and accumulation is (or was) based on family labour and larger farms where labour, on the whole, is in the form of salaried employment. The life-cycle approach cannot be used in the latter case. These farmers are then considered entrepreneurs and are classified as type IV (Table 15.1).

15.2.4 The Life Cycle of the Coconut Farmer

The life cycle of the farmer is characterized by the changing needs of his family, his capacity for work and his wealth in relation to his age. As Table 15.1 shows, the life

cycle is divided into three phases (I, II and III). If we group rural families, at a given time, on the basis of the life phase of the head of the family, we get a representation of the social organization in the village based on coconut cultivation. Exchanges of land, money, work and products find their usefulness in the light of the main objectives of the head of the family at each phase of his life cycle, and in accordance with the perception he has of his needs during his lifetime.

The incompressible needs of a young head of a family (phase III) are low and he has not yet bought or inherited coconut plantations. In these circumstances, his only source of income is the wage he receives as a casual worker during harvest and post-harvest periods in coconut plantations owned by older (phase I) or wealthier (phase IV) farmers. A major portion of this income can then be saved with the goal of eventually buying a coconut plantation.

Profits arising from the ownership of a coconut plantation as well as his wages will allow a young head of a family to meet his projected increase in needs. This will mainly concern expenses related to food and children's schooling in the next phase of his life cycle (middle age, phase II). In addition, the current coconut plantation, as well as any that could be acquired later (purchase, inheritance) will constitute the capital that will generate profits and provide him with his only source of income when he becomes too old (phase I) to do the kind of work on his coconut plantation(s).

Middle-aged heads of families (phase II) will continue to save, as far as possible, to develop their retirement capital: the coconut plantation.

For the elderly heads of families (phase I) with no longer any dependents, the income from their capital of the coconut plantation could generate a surplus that would allow them to make a pilgrimage to Mecca. In the worst case, they could dissolve their capital by selling the coconut plantation and spend their old age in the care of their children. It was noticed that village plantations did not exceed 5 ha, while those of entrepreneurs (phase IV) could be as big as 20 ha.

15.2.5 The Predominance of the Life Cycle in the Social Structure

The coconut harvest is sold to traders. This can be in the form of nuts immediately after they are plucked, or in the form of copra. For harvesting or post-harvesting work, casual workers are paid either in kind (a portion of the harvest, usually half of it, is given to the workers) or calculated on the basis of a fixed rate per nut for each type of work. Finally, agreements for short-term loans link coconut plantation owners to traders. Coconut harvests, once about every 2 months, help repay loans.

Chinese or Malay traders frequently own land. They constitute the biggest percentage of villagers who we classify as entrepreneurs. On the one hand, the size and diversity of the activities in their plantations is such that they have to rely primarily on paid labour; on the other, they have sufficient capital which can be rapidly moved and deployed to take advantage of the most profitable investment

opportunities. Their farms are generally larger than those of farmers. However, two factors have prevented land concentration:

- The establishment of Malaysian reserves, a legacy of the British times, with a prohibition on the sale of certain lands to the Chinese;
- The richest Malay Muslims often became polygamists. Consequently, a coconut plantation established during the life of the head of the family was divided among his many children, in accordance with traditional rules of transmission.

In consequence, these entrepreneurs do not play a major role in the social control of land. Coconut plantations therefore represent well the fundamental connection between the life cycle of the farmers and the social organization of the village.

15.2.6 The Role of Cocoa Cultivation in the Restoration of the Social Fabric

It is important to distinguish between the role of cocoa cultivation in the village economy and various external factors that led to its introduction. The interpretation proposed here considers the introduction of cocoa (between 1970 and 1980) as a method of re-establishing a specific social functioning of villages, which had been based on coconut plantations. In the late 1960s, the conditions for establishing social equilibrium, solely through coconut plantations, were no longer being met. They were:

- the purchasing power of copra had to increase in order to compensate for the decrease in farm sizes;
- the new generation had to ensure availability of labour required to harvest coconuts;
- there had to be some security in supply and marketing.

This last point did not seem to be a problem, but renewal of the labour force implied that coconut plantations must offer the same benefits as other economic sectors, in terms of wages, access to credit and pension systems. This was a particularly important consideration for young men who did not yet own land and therefore constituted the most mobile labour force.

However, the low price of copra between 1965 and 1975 led to a failure to meet the growing needs of the entire population dependent on coconut cultivation. Faced with this situation, young people took up jobs in other sectors of the booming economy. This exodus of professionals threatened to unravel the social organisation described above.

Before explaining how the various categories of villagers reacted to this crisis in the coconut economy, we should present the factors that led one of the villages to adopt cocoa extensively in 1975 and thus restore stability, in terms of the afore-mentioned scenario, to the shaky social organisation in the village. In the other village, where the economic importance of coconut was waning gradually, a very small number of farmers adopted cocoa cultivation before 1985.

Some factors were common to both villages: price of the products, production factors and the national government's agricultural policy. On the one hand, the price of cocoa applied to everyone—a few geographic-based variations aside—and the particularly high prices in 1976–1977 helped launch the growth of cocoa cultivation in Malaysia. On the other hand, the 1969 race riots highlighted the marginalization of Malaysian rural society within a growth model retained from colonial times. The government had to, henceforth, take into account this section of the population whose demographic importance continued growing. Small coconut farmers, who represented one of the poorest social groups in Malaysia, soon benefitted from numerous projects to improve their means of production.

From 1972–1973, the research and development entities which were set up for this purpose advocated planting cocoa in the understory of coconut trees as the solution that best met the needs of farmers. They did so on the basis of the following qualities:

- cocoa could start producing quickly, from the 3rd or 4th year;
- cocoa could be harvested every week so it would bring in a regular income;
- cocoa farming required much more work than coconut plantations, and was considered suitable to keep family labour engaged (considered to be under-employed) and check the exodus from rural areas;
- under the aegis of development policies, cocoa saplings and sufficient inputs could be provided to farmers for 3 years prior to the crop's entry into production;
- the socio-economic data at the local level varied widely from village to village.

Only a road separates Sungai Batang village from large commercial plantations which had been cultivating cocoa in the understory of coconut trees since the 1960s. This proximity to commercial plantations not only helped organize the labour and produce markets, but also played a significant role in disseminating techniques and information about cultivating cocoa under coconut trees and other know-how pertaining to cocoa cultivation. The rural labour market was based mainly on coconut-harvesting work. The remuneration for casual labour kept pace with that of workers in large plantations near the village, which was negotiated between labour unions and company management at the national level. Indeed, remuneration in the village tended to be higher to prevent an exodus of village labour to the large plantations. Due to a lack of availability of labour and difficulties faced by owners to recruit casual labourers, labour wages varied little, unlike in large plantations, and barely tracked the fluctuations in copra prices. The lack of industries near the village forced villagers to move far away in search of work, thus affecting the renewal of village labour. This exodus weakened intergenerational relationships and risked depriving elderly farmers of their children's support.

Parit Haji Abdul Salam village is part of the Batu Pahat district, which is an industrial area. The professional exodus, in this case, did not require people to move far away and thus did not lead to an isolation of the elderly.

As far as the opportunities to plant cocoa trees were concerned, the response of these two villages depended largely on local characteristics. We will study, in each

village, the behaviour of individuals in different age groups with respect to the opportunities offered by the local environment, and how each of these behaviours is linked to the others.

15.2.7 Cocoa, a Response to the Coconut Crisis in Sungai Batang

15.2.7.1 Establishment of Cocoa Cultivation

High cocoa prices in 1976–1977 resulted in a massive increase in the cultivated area of cocoa in villages. The presence of large plantations and the existence of a marketing network also supported this development. More importantly, cocoa helped meet the immediate need of retaining young workers in the village in order to maintain sufficient labour for coconut plantations.

The introduction of cocoa helped retain young people in the village by establishing cocoa-specific farm tenures. A farmer who owned a coconut plantation and was burdened with high familial needs usually planted saplings himself. He added cocoa to his plantation capital, and accorded it as much importance as coconut. This allowed him to increase his total income from the plantation. The cocoa plantation also helped him diversify his tree capital.

Farmers with little or no requirements allowed their son or sons-in-law to plant cocoa in their coconut plantation. The son grew cocoa and maintained his father's coconut trees in the process. The cocoa harvest belonged to him, while the coconuts still belonged to his father. The cocoa trees then represented a capital for the young farmer. The arrangement between father and son was not bound by time, and was valid even after the death of the father and during the division of assets between his children. The same land thus had two plantations that were managed by two different people.

This unusual mode of tenure of cocoa plantations helped retain the young labour force in the village. In fact, for the young, cocoa was a source of income and a heritage. Besides, it offered the prospect of accumulation which had seemed unlikely until then due to the partitioning of the land.

The key role of coconut plantations in the life cycle was thus restored. Even though this free transfer of the right to use land from the elders to the young amounted to a sacrifice, it was necessary for social cohesion in the village.

15.2.7.2 Heritage Status of Cocoa and Coconut Plantations

The advantage of the concept of inheritance, as distinguished from those of capital and savings, lies in the modalities of acquisition and transmission of assets which are considered as the farmer's heritage. Thus, while the coconut plantation, inseparable as it is from the land on which it grows, is bequeathed to all children

equally, with the occasional difference between boys and girls, the right to use the land to grow cocoa is accorded only to children who remain with the father.

We documented an instance of the transmission of a cocoa plantation. The father, who worked on the land since 1976, passed it on to his 20-year-old son. A part of this cocoa plantation was held by the father under a tenant farming model; this too was transmitted. Thus, a cocoa plantation is clearly distinct from a coconut plantation, as much in its functioning as in its inheritance characteristics.

The fairness or, at least, the equality of such sharing amongst the children is thus challenged. Should this cocoa innovation be related to changes that occurred in the renewing of the village population, when only one or two children per family—which has six children on an average—now stay in the village?

15.2.7.3 The Increase of Areas Under Cocoa Cultivation in 1980

Whenever possible, farmers first planted cocoa on their own plots or on those of their parents. Thereafter, their aim was to plant cocoa on other favourable plots. This was facilitated by the emergence of sharecropping.

15.2.7.4 Types of Sharecropping

Sharecropping constitutes an opportunity for a landless farmer or one owning very little land—and with little or no prospects of inheriting a father's plantation–, to plant cocoa. Sharecropping is an arrangement between a villager who wishes to plant cocoa and the coconut plantation owner who has emigrated, has another occupation or is just too old. Normally, the landowner gets one-third of the harvest of fresh beans. This quantity may increase to two-thirds of the crop, especially when the owner himself helps in the planting.

The areas under cocoa thus increased considerably and incomes increased without a proportional increase in labour. It was a matter of taking advantage of high prices and of subsidies available for inputs.

It is mainly the young farmers who enter into sharecropping agreements: their family needs are still low and they have surplus labour time that can be used to plant and maintain young cocoa saplings. Since sharecropping contracts are generally for a duration of 25 years, it is mainly the young farmers who are interested.

In contrast, older farmers have higher incompressible needs. Given that they farm their own cocoa—which are of small size–, they have no other alternatives than to intensify labour and inputs to benefit from high cocoa prices. Inputs for the cocoa plantation are then bought with the revenue generated from cocoa.

Figure 15.2, created using data collected from farmers in 1989, shows the structure of farms as a function of the age of the farmers. In conformity with Fig. 15.1, which summarized Modigliani's life-cycle model, the polynomial function was adjusted to the area of the coconut plantation owned, based on age. It

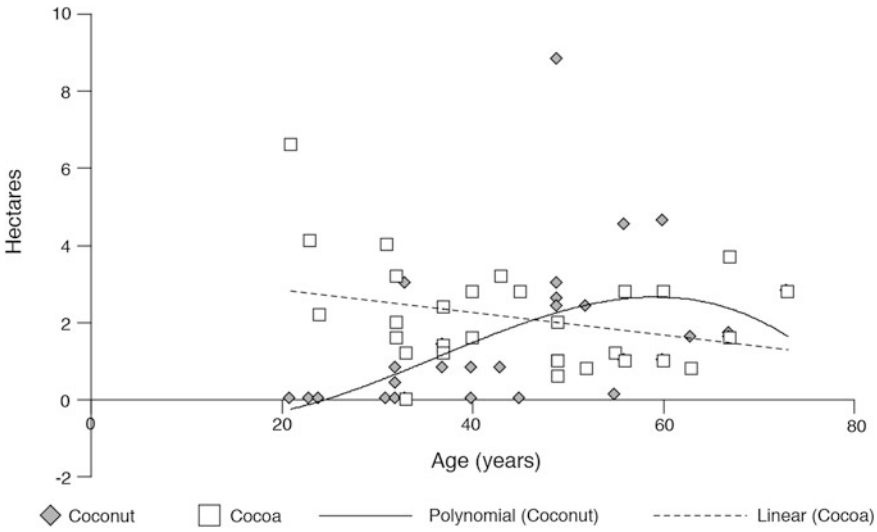


Fig. 15.2 Coconut-farm assets and the area under cocoa: polynomial function adjusted to the area of self-owned coconut farm (*sources* authors' surveys 1989)

clearly shows a tendency of an increase in the coconut plantation asset until about the age of about 60, after which the value of this asset declined.

In contrast, the area under cocoa decreased linearly with age: the additional income from cocoa mainly went to the young people, who divide their time between cocoa and coconut cultivation. Cocoa plantations helped retain the youth in the village and, to some extent, also helped maintain the labour force necessary to maintain the coconut plantations of the elderly.

Figure 15.3, created with data collected from the same farmers, illustrates the diversity of land tenure types that were used for cocoa cultivation (Table 15.2).

15.2.7.5 Technical Performance of the Cocoa System Under Coconut

Yields recorded in village farms were very low compared to those in neighbouring large plantations. In fact, the Bleinheim-Estate plantation recorded a dry beans yield of 1.5 tonnes/ha/year in a non-grafted orchard that was 20 years old. The intensive cultivation method allowed a steady increase in yields despite the age of the cocoa.

A survey published by Shaaban Bin Sahar, Malaysian socio-economist, showed that yields in village farms were between 170 and 320 kg/ha/year of dry beans for orchards ranging in age from 4 to 8 years in the same district. A small number of farmers achieved a yield of 600 kg/ha/year of dry beans.

In 1989, estimates obtained from our surveys confirmed these figures for orchards that were 10–15 years old. Farmers who were interviewed affirmed that the maximum yield was achieved between the 6th and 8th year after planting, after which the yield decreased gradually. These low yields can be explained by the

Table 15.2 Structure of orchards and land tenure types of cocoa plantations in Sungai Batang in 1989

Individuals	Age	Area of self-owned cocoa plantations (1 acre = 0.405 ha)	Area under cocoa plantations (acres)	Owner farmed	Tenant farmed	Sharecropping	Farming for free
1	21	0	16.5				16.5
2	23	0	10.25		4		6.25
3	24	0	5.5		5.5		
5	31	0	10		5		5
6	32	0	5		3		2
7	32	2	4	2			2
8	32	1	8	1		7	
9	33	7.5	3	7.5	1	3.75	5.75
10	33	0	0				
11	37	3.5	3.5	3.5			
12	37	2	3	2	1		
13	37	3.5	6	3.5			2.5
14	40	0	7				7
15	40	2	4				4
16	43	2	8			5	3
18	45	0	7			7	
19	49	22	5	5			
21	49	7.5	1.5	1.5			
22	52	6	2	2			
23	55	0.25	3	0.25			2.75
24	56	2.5	2.5	2.5			
25	56	11.25	7	7			
26	60	2.5	2.5	2.5			

(continued)

Table 15.2 (continued)

Individuals	Age	Area of self-owned cocoa plantations (1 acre = 0.405 ha)	Area under cocoa plantations (acres)	Owner farmed	Tenant farmed	Sharecropping	Farming for free
27	60	11.5	7	7			
29	63	4	2	2			
30	67	4.25	9.25	1.25		8	
31	67	4	4	4			
32	73	7	7	7			
33	49	6.5	2.5	2.5			
34	49	6	2.5	2.5			
Total			150.5	66.5	19.5	30.75	56.75
Average			5	3.3	3.25	6.15	5.15

source authors' surveys 1989

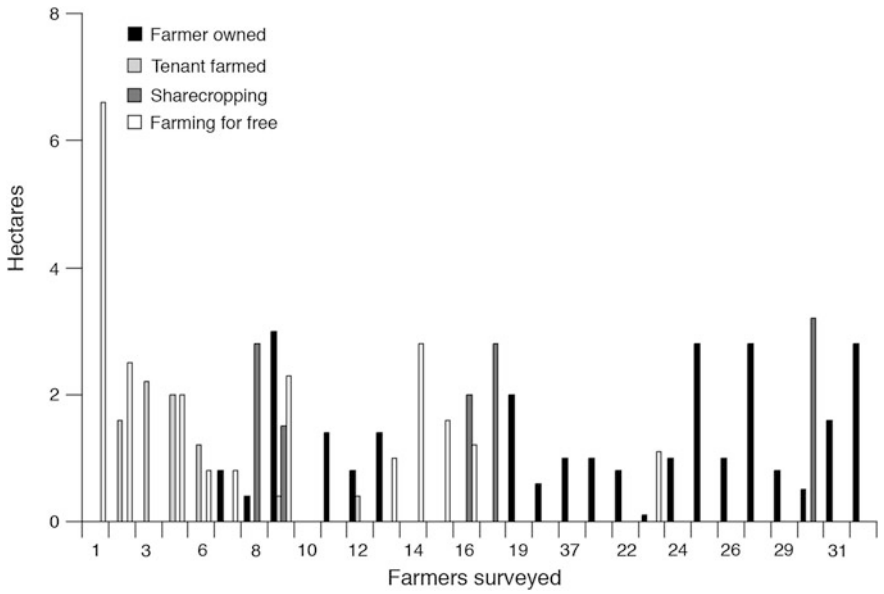


Fig. 15.3 Land tenure types for surface area under cocoa (*sources* authors' surveys 1989)

agronomic characteristics of cocoa grown in the understory of coconut trees in village plantations. Normally, two rows of cocoa are intercropped between two rows of coconut trees, with densities of 750 cocoa and 153 coconut trees per hectare. It should be noted, however, that the Malaysian extension authorities recommended a density of 133 trees/ha for coconut.

The introduction of cocoa also brought in a more widespread use of herbicides that reduced weeding work in plots, which was, in any case, already reduced because the shade of cocoa trees inhibited the growth of grass and weeds. Lime was widely used to counter the effects of flooding on cocoa trees. The use of fertilizer, on the other hand, must be studied more carefully. According to reports published in the 1980s and our surveys conducted in 1989, most farmers stopped using fertilizer on their plantations when subsidies were withdrawn. Their expenditure on inputs was less than MYR 200/ha (USD 70/ha).

Although some entrepreneurial and middle-aged farmers had a relatively small cocoa area measuring about 1 ha each, their family needs were high. They used fertilizer, and sometimes insecticides too. Their expenditure on inputs amounted to about MYR 500/ha (USD 185/ha). Their yields, more than 400 kg/ha/year of dry beans, were high compared to other farmers, but they were still much smaller than those of large plantations.

Researchers and developers suggest that the yield was low because, despite intensification, there was too much shade on the cocoa trees and inadequate drainage in the plantations. These parameters limited the effectiveness of intensified use of inputs and labour.

15.2.7.6 Effects of Cocoa-Coconut Intercropping

The maintenance of cocoa trees cannot be separated from that of coconut trees. It seems that the increase in coconut yields is due to the use of subsidized fertilizer meant for cocoa trees. The harvesting of coconuts, on the other hand, has become more difficult as cocoa trees hamper movement, and care must be taken not to break their branches when coconuts are being plucked. Plantation owner-farmers observed that an intensification of cocoa increased the coconut rent.

Farmers regarded cocoa and coconut as two distinct assets. Research and development centres have suggested that cocoa yields could be improved through intensification, shade management and grafting on adult cocoa trees. They attributed no economic importance to coconut, stating that its primary purpose was to provide shade to cocoa trees. But what, in reality, is the place of the cultivation of cocoa and coconut in the family economy?

15.2.7.7 Cocoa in the Family Economy

The reality of farming families can be very different from the way the research and development entities perceive it to be. According to surveys conducted by Shaaban Bin Sahar, when the procurement price of cocoa was between MYR 4.5 and 5.6/kg of dry beans (USD 1.6–2.1/kg) in 1979–1980, cocoa accounted for roughly 50 % of the household income. In 1989, due to falling prices and stagnating yields, this contribution dropped to less than 25 % for most of the households surveyed. Income from cocoa then became secondary in the family economy.

The organization of the working day too was representative of the lower importance of cocoa as compared to coconut. Four to five hours of uninterrupted work was reserved for harvesting coconut in the morning by farmers of type II and type III. Work related to cocoa was taken up in the afternoon, from 14 to 17 h, between the two prayer times. Moreover, social activities (weddings and political meetings) or religious activities which took place in the afternoon often took priority over cocoa-cultivation activities. Cocoa cultivation was then regarded as an addition to the normal workday and did not necessarily form a part of it.

As far as income flow was concerned, harvesting work for coconuts provided a daily or almost-daily income. It allowed the meeting of daily expenses on food and children's schooling, which made up the family's incompressible needs. In this regard, we showed that the share of casual labour needed to harvest coconuts in the total working time tended to be especially high when irreducible needs were high and the assets of the family head were small (Dupraz 1989).

Income from cocoa came in for only 4–6 months in a year and it was also subject to climatic variations stemming from quasi-annual floods and to price fluctuations. This income was then added to the daily wages, and sometimes even substituted it when cocoa prices were at their peak.

This income often allowed farmers to meet new expenses which arose following electrification in 1970. Contrary to the expectation of agricultural research and

development institutions, cocoa only had secondary importance in the family economy of farmers. It represented a diversification of the tree capital whose main role was to restore the economic and social role of coconut cultivation in the village. There is thus a disconnect between research efforts to improve cocoa yields and the perception of farmers.

15.2.8 Increasing Disconnect Between Farmers and Research and Development Institutions

Government entities were initially created to develop coconut-associated cultivation systems with a goal of eradicating rural poverty. We take a look at how well they have reoriented themselves around cocoa cultivation in terms of production. In the laboratory and field station, the technical and economic performance of cocoa relegates coconut to second place. The breeding programme for cocoa through grafting on adult trees of selected clones, set up by the Malaysian Agricultural Research and Development Institute (Mardi) in 1985, is an illustration of this development. It was expected that this method would lead to the breeding of high-yield clones with larger-sized cocoa beans.

Mardi set up pilot facilities to supply cocoa grafts, mainly in Sungai Batang. An extension agent was appointed for a 2 year period to distribute the grafts and the associated technical package: fertilization, felling of old trees and optimizing shade by removing some coconut trees. The non-compliance with fertilization recommendations affected the development of the clones and the fruits failed to mature. Furthermore, shading had to be maintained within bounds for fertilization to be effective. The farmer received free all the necessary inputs only when all the trees are grafted. This strict condition partly affected the development and dissemination of grafting. In fact, the survey suggested that the results of this endeavour by Mardi were, on the whole, unsatisfactory. Few farmers (<6 %) grafted all the trees on their plots. The identified causes of failure were mainly moisture or drought which ruined the graft and, consequently, delayed fruiting (waiting period >2 years).

In fact, the technical package could not be fully applied by farmers who usually did not use fertilizer routinely for their cocoa (extensive farming practice), or who did not own the coconut trees. Moreover, the not-so-promising results of the first grafts quickly discouraged farmers.

Thus, the existence of distinct property laws for cocoa and coconut plantations and the extensive farming practice for cocoa were factors Malaysian research did not take into account. Its output-oriented perspective was contrary to the farmers' plantation management practices.

It also appeared that farmers, for the most part, were not inclined to specialize in cocoa cultivation. They did not believe that intensification would lead to the promised increase in yield. The move towards diversification of agricultural activities appeared to be more pronounced in villages.

15.2.9 The Diversification of Activities: A Response to a Decline in Cocoa Prices

The most important diversification activities consisted of the initial processing of beans, livestock rearing, cultivation of bananas and various fishing activities. Their essential feature was not to disturb the usefulness of cocoa as a tree capital, which was true for most farms. These activities resulted from opportunities that the environment provided and became more attractive as cocoa prices declined. Type II and III farmers resorted to a diversification of their activities to compensate for the loss of purchasing power resulting from lower cocoa prices.

Based on the economic performance and the short- and long-term needs of families, these activities were an addition to, or a partial substitution of, the work period earlier devoted to cocoa cultivation: the afternoon. The morning remained reserved for coconut harvesting activities.

15.2.9.1 Initial Processing of Cocoa

The initial processing of cocoa consists of converting fresh beans to dry beans using fermentation and drying. The sale of dried beans increases income by 50 % compared to fresh beans. Initial processing requires little equipment and can easily be done by the farmer, making it a good way for him to offset falling prices. The Federal Agriculture Marketing Authority started actively disseminating and popularizing fermentation techniques in 1980. Although very few producers dried beans before selling them in the early 1980s, a majority now sells dried beans.

15.2.9.2 Pasture-Fattening of Livestock

Livestock activities could be increased through the establishment of grazing areas between the village and the sea. The government has allocated such areas to poor families since 1970 within the framework of the poverty eradication policy. Coconut plantations came up here as coconut was the only species that could tolerate this brackish soil. These new lands led to an increase in the demand for casual labour for harvesting coconuts. Although these lands were not fit for intercropping, they could be used as extensive grazing areas. The drop in cocoa prices reduced the wages for labour for cocoa cultivation to a level comparable to those paid for livestock rearing. Consequently, type I and type II farmers did not stand to lose much by according a lower priority to cocoa, which they continued to harvest in order to sustain this other activity.

The economic parameters of livestock breeding are diverse and involved all types of farmers: livestock is a capital and represents the piggy bank that is broken for one-time big expenditures such as buying a motorcycle or a house, or paying for a child's university admission. Livestock rearing can generate wealth rapidly. If a

livestock breeder is in a position to postpone the regular income from livestock, then by selling three heads of cattle, he can buy back five. The herd then increases geometrically in relation to the number of livestock rotations. The rotation period ranges from 12 to 18 months.

This aspect explains the attraction livestock rearing has for the youth (type III). It is possible to start this activity without capital, by first rearing cows as a sharecropper. Coconut plantation pastures are available for use to livestock breeders in exchange for the maintenance of the plots, which is, in any case, essential for livestock farming. For farmers—mainly type-I older farmers—who give out their cattle through a sharecropping model, livestock remains, despite the inherent risks involved, a high-returns investment and one that does not conflict with Islamic injunctions on financial interest.

15.2.9.3 Banana Cultivation

Banana cultivation is characterized by low labour requirements and a fortnightly income. Bananas are currently associated with cocoa where, for example, they serve to replace fallen cocoa trees.

The decline in cocoa prices resulted in lower land rents for coconut plantations. In the future, banana plantations may even come up in old abandoned cocoa plots. This is already the case with some farmers who have large cocoa plantations, but no longer have sufficient labour to replant cocoa and maintain new plots. They take advantage of the slightest demand for land and lease it out for banana plantations. Although the per-hectare income from banana cultivation is lower than that of cocoa, it fetches them better returns per labour hour since the labour requirement is low.

15.2.9.4 Fishing

Shrimp fishing is done at night in village drains, and the catch is either home consumed or sold. It can offset the effects of a decline in cocoa prices on the standard of living, even though the total labour time is increased. After their busy work day, type-II farmers, who also represent the most disadvantaged lot, sometimes spend a large part of the night catching shrimp.

In contrast, clam fishing is a seasonal activity that coincides with the peaking of cocoa production, thus directly impacting the harvest of cocoa pods. It is mostly type-III farmers who are involved in clam fishing.

In addition to new coconut plantations that gradually enter into production, all these activities are extensification factors for cocoa cultivation. They compete with cocoa in terms of the labour time and the intermediary inputs devoted to them. Cocoa, which is a productive asset, may increasingly become a sleeping asset.

The access farmers have to diversification activities varies; it depends on their resources and geographical location within the village. Thus, some have no alternative but to increase the number of hours spent as casual labour for harvesting

coconuts, and to ask their wives to help out with the cocoa cultivation. Farmers make the best they can of the flexibility of a non-specialised production system to deal with climatic and economic risks.

15.2.9.5 Agricultural Exodus and Cocoa Cultivation in Parit Haji Abdul Salam

The end of the 1960s and the 1970s witnessed a shift in occupation at Parit Haji Abdul Salam of most type-II and type-III labourers. They moved from being casual workers for coconut harvesting to being salaried employees in the tertiary and secondary sectors. The few remaining workers diversified their activities, by constructing their houses, for example. This diversification was the result of the local mode of payment (half of the harvest), which helped coconut labourers manage the effects of price fluctuations. There was no longer enough labour available to meet the harvesting requirements of all the coconut plantations, and the workers opportunely chose to work in the largest plantations.

Thus, the older type-I farmers had no alternative but to undertake a part of the harvest and process the nuts by themselves. They ultimately became dependent on their children to fulfil most of their needs. A few type-II farmers continued growing cocoa after 1974 with government aid for revival of farms. They replicated the phenomenon observed at Sungai Batang.

15.2.9.6 Various Opportunities of Diversifying from Coconut Cultivation

The three types of agricultural diversification we have examined are: coconut intercropped with cocoa, with coffee, and the substitution of coconut with oil palm. These three cropping systems all begin producing from the fourth year after planting. Within the framework of a cocoa project, cocoa saplings, inputs and processing equipment were offered to farmers at a 50 % subsidized rate starting in 1985. In addition, a collective extension, processing and marketing programme was also implemented.

The economic characteristics of unsubsidized cocoa and coffee cultivation are similar: high per-hectare requirement of labour. According to the farmers, a full-time labourer can handle a plot of 1.5–2 ha where intensive methods, including chemical weeding, are practiced. This work is, however, physically possible for everyone, including women, children and the elderly. The per-hour labour wage is low compared to that obtained in oil palm cultivation.

The gross margin per hectare of cocoa and coffee crops grown under coconut trees is also significantly lower than that for oil palm. This stems from a partial or non-harvest of coconuts and a drop in cocoa prices. Although coffee harvesting is a more delicate operation than that of cocoa, it can tolerate soils that are more acidic and hydromorphic. Coffee is more resistant to defoliating caterpillars, a known pest

in the region, and tends to offset the advantages of cocoa cultivated with the help of subsidized chemical inputs.

The most remunerative crop per hectare, in terms of money and, even more, labour time, is oil palm. Even though the investment required for setting up an oil palm plantation is very high, it is possible to start recovering it from the fourth year if the farmer himself provides the labour. Although palm trees can be maintained easily, harvesting can, however, only be done by younger men.

15.2.10 Behaviours of Different Types of Farmers

A minority of land owners consists of current or former salaried employees who are more than 50 years old. Most of them inherited a small coconut plantation. Having a salary, pension or savings when they quit their job, or sometimes even help from their children, their plantations are not essential to their livelihoods. Despite their low profitability, cocoa and coffee are the only crops that these farmers can, or will be able to, physically maintain and harvest by themselves, once they retire.

In 1985, subsidies and relatively high cocoa prices impelled these farmers to extend the cultivated areas under this crop onto the most marginal soils. This explains why more than half (5/8) of the rural coconut plantations are officially intercropped with cocoa. Some of these cocoa trees, however, will never enter into production.

It is actually on these marginal soils that some farmers have converted part of their coconut plantations, before or after planting cocoa, into oil palm plantations. In this way, they have truly diversified their plantations. Such conversions translate strategies of mitigation of risks arising from wide price fluctuations of agricultural products and the scarcity of casual labour to harvest palm bunches.

This last point explains why the farmers who were the quickest to implement this partial conversion were actually those who had teenage or adult sons still living at home. A few farmers without a young labour force at hand have already converted their unproductive cocoa plantations to coffee. The other farmers own only a small fraction of the cultivated area.

Young salaried workers who own land also plant oil palm. Although such a worker's permanent job only allows him to grow a crop that demands a minimum of labour, it gives him access to credit required to plant oil palm, which is difficult to obtain for other crops. Some even take the money lent by their employer to buy their parents' plot. These latter then either invest the money or use it directly to sustain themselves in their old age.

The few casual workers who opted to remain in agriculture were often the most disadvantaged ones, both in terms of access to land and access to credit. Their main objective, even as they get older, is to maximize income from their labour, even if means having to put in painful hours of labour.

When the cocoa project was launched, they entered into 8 year contracts which allowed them to plant and cultivate cocoa plantations belonging to non-resident or

busy land owners who wanted to create a retirement nest egg. The ownership of the cocoa trees reverted to the owner at the end of the contractual period.

Following a decline in cocoa prices, these farmers preferred to be sharecroppers on oil palm plantations. They so preferred to cultivate this crop on their own lands that they even took on loans at usurious rates.

Cropping systems adopted by most farmers are intensive in chemical inputs and labour. This is due to several factors:

- cocoa has replaced coconut as retirement capital;
- no heritage capital status forbids the regulation of shading for cocoa, usually undertaken through the poisoning of the extra coconut trees;
- many farmers do not depend on cocoa for their survival. They do not mind a small profit or even none.

The decline in cocoa prices only affects those farmers whose incompressible needs have to be covered by cocoa income. The result is a reduction in spending on inputs. This saving is often achieved by substituting chemical weeding by manual weeding in plantations with a sufficient availability of family labour for the area concerned.

Under current conditions, given the young age of cocoa plantations (3–5 years) and an elderly labour force obliged to cultivate cocoa, the production of cocoa can only increase when the plantations become mature. Cocoa cultivation, intensive for the most part, has been established and maintained with the help of external funds.

15.3 Conclusion

Malaysia's cocoa boom-and-bust cycle was one of the fastest in history. At its peak, cocoa production exceeded 200,000 tonnes, catapulting Malaysia to the 4th or 5th position of global cocoa producers. Today, however, Malaysia's contribution to world cocoa production is marginal, with an annual output of 25,000 tonnes in the 2000s. The question, however, is whether the cycle of cocoa diversification was truly without value for the country and for family farming?

This short history of plantations led to significant investments in the processing industry (butter and powder) at national level. This is an asset for Malaysia as well as for south-east Asia, and an excellent outlet for the Indonesian cocoa sector that has developed in the meantime.

In 2000, family farms in Malaysia produced almost all of the 25,000 tonnes of the country's cocoa production. Large plantations had, in fact, already switched to oil palm or fruit trees. Cocoa cultivation played an important role at a particular time in the country's history: it created jobs for young people and helped preserve a social structure, at least for a while. It also helped reduce rural poverty in a country undergoing rapid urbanization. Just as in the case of Côte d'Ivoire and Ghana (Chaps. 2 and 8), the Malaysian experience introduced the important concept of retirement capital: cocoa (or some other perennial crops, such as rubber) can

represent a diversification of activities and incomes for salaried people in urban areas who are planning for their retirement in their villages.

The basic hypothesis of the book is reflected in the determinants of this diversification cycle, in conjunction with prices: the essential role of ecological change; rents of the natural environment and their exhaustion; life cycles of trees and of families.

Thus, cocoa was introduced on the west coast when coconut orchards were in full decline. Plantations were owned by aging farmers who wanted to convince their sons to stay with them. The coconut cycle belonged to the parents. The diversification through a new cocoa cycle, however, pertained to the new generation. This new diversification encompassed cocoa, banana and even fishing, and occurred when cocoa trees were aging and prices of the crop falling. The newest developments in the 2000s seemed to favour oil palm cultivation. This is, once again, a new diversification and a new cycle, which is helping draw value from degraded lands and underpinning the aspirations of a new generation.

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