Marketing of Rice, Cassava and Coffee in Lampung, Indonesia

Eric Mougeot

Patrice Levang

The CGPRT Centre

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Private road specially built for coffee marketing pays off very quickly

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Biro Perencanaan
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Photographs: Eric Mougeot.

Foreword

In this volume, research results concerning the marketing of rice, cassava and coffee, in Lampung Province Indonesia, are presented.

The study was carried out as a collaborative activity by the Department of Transmigration and the Institute Français de Recherche Scientifique Pour le Développement en Coopération (ORSTOM).

This study is relevant to students of settlements and market development. In addressing market practices in the emerging market systems in a settlement area, issues are studied which are rarely being researched. The essential differences between the crops - rice being a staple crop, coffee a perennial commercial crop, and cassava which is a long duration commercial and security food crop - provide a dynamic view of linkage in the rural economy of a settlement area. It is expected that this study will contribute to further thinking about research and development in settlement areas.

Pierre Rondot
Patrice Levang

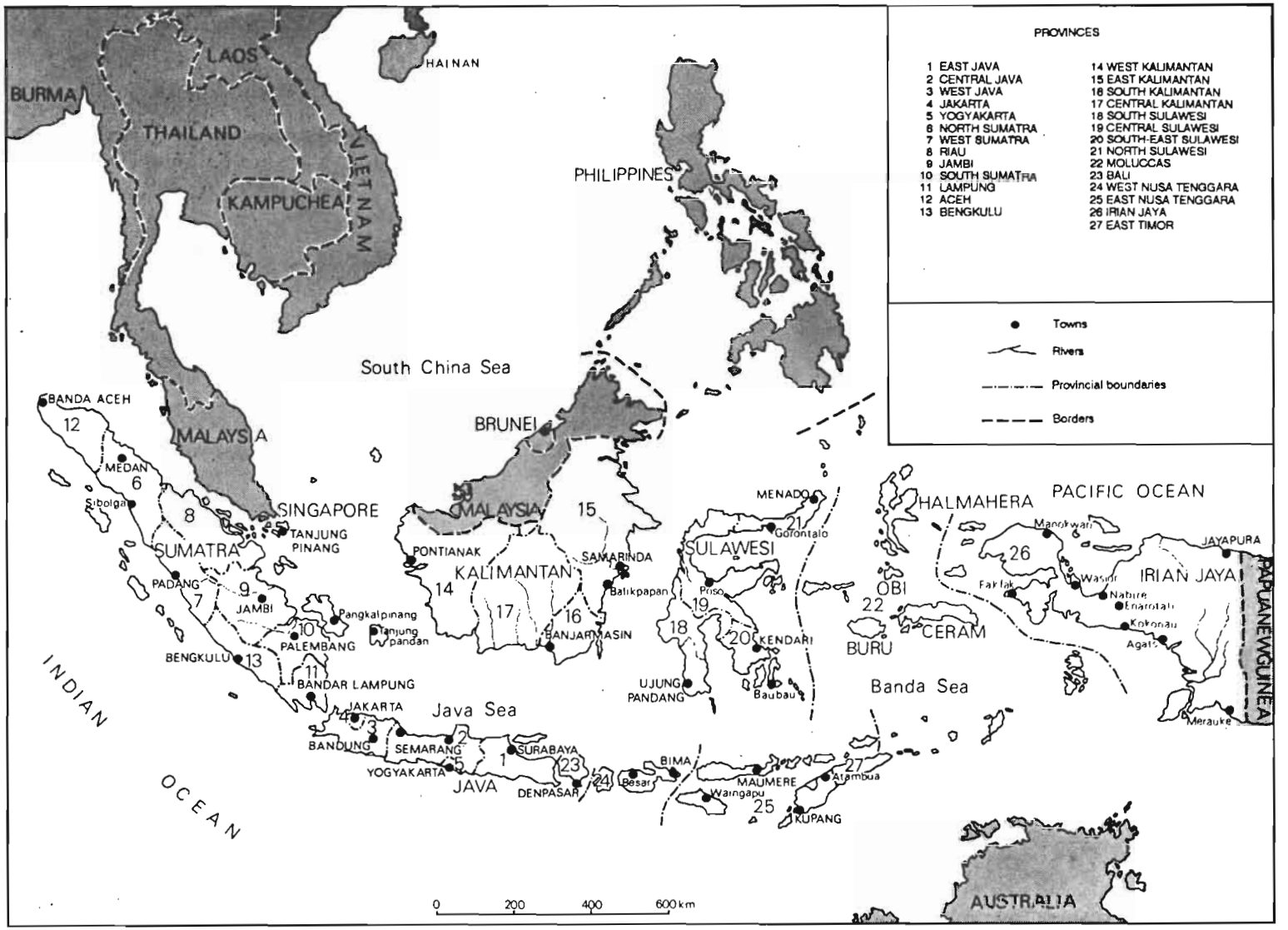

Figure 1 INDONESIA (situation map)
Source: Atlas Indonesia, 1983

Summary

General characteristics of commerce in agriculture in the Province of Lampung are discernible:

Not surprisingly, commercialization (collection trade, processing and wholesale) is in the hands of private enterprises, with the exception of the rice sector, in which the government has stimulated the creation of village co-operatives. However, collection via the public market is still very limited, approximately 10% of the total production;

Commercialisation of agricultural products rarely has an impact on their production. Some farmers carry out commercial activities during the harvest, but their economic impact is always limited. As harvest dates are always very close together, there is little difference among merchants, who usually participate in the commerce of other agricultural products of their region;

Generally the merchants, even those with the highest turnover, (first quartile) lack capital for their businesses. Even though the banking system has improved, it still cannot provide neutral financing for the Lampung businessman. The small-scale local collectors depend heavily on the dealers, wholesalers, and exporters for capital (Tab. 1).

Table 1 Financing the enterprises

Turnover	Self-financed	Financial aid
First quartile	78%	22%
Second quartile	74%	26%
Third quartile	63%	37%
Fourth quartile	56%	44%
Total	70%	30%

Source: field surveys, 1987.

There is a marked ethnic differentiation over the quartiles. Whereas the population of the province is presently 78% Javanese, 20% Sumatranese, and 2% Chinese, the relative proportions of these three ethnic groups are not reflected in our survey. Usually Chinese are engaged more often in commerce. (Tab. 2 and 3);

At the level of the small-scale collector, commerce is handled entirely by specialized companies that can provide shipping at relatively low prices in the regions where the road network is well-developed such as Lampung *Selatan* and Lampung *Tengah* (Rp 0.10 to 0.15/kg transported and per kilometer, to wit US$ 6 to 9 for the transport of one ton of goods over 100 Km). But in the regions with poor roads (asphalt roads in bad condition or simply earthen trails), typical of the regions in which transmigration has only recently appeared, shipping costs double, which seriously hinders the development of commercial agriculture;

A clear correlation was found between higher turnover of businesses and their age. Inversely, young businesses more often had a low turn-over.

Table 2 Distribution of ethnic groups according to turnover

Turnover	Chinese	Sumatranese	Javanese
First quartile	21%	56%	23%
Second quartile	32%	5%	63%
Third quartile	4%	31%	65%
Fourth quartile	5%	5%	90%
Total	16%	25%	59%
Distribution in Lampung	2%	20%	78%

Source: field surveys, 1987.

Table 3 Distribution according to duration of commercial activity

Turnover	0-5 years	5-15 years	> 15 years
First quartile	5%	67%	28%
Second quartile	32%	58%	10%
Third quartile	42%	42%	16%
Fourth quartile	61%	22%	17%
Total	35%	34%	31%

Source: field surveys, 1987.

The most developed commercial sector is the plantation sector. The relative wealth of the plantation sector is also felt at the level of the producer. But in this sector, there also remains a number of cases of exorbitant credit rates with repayment in kind. This system disadvantages the farmers altogether, because the loan contractors establish rates for raw materials that are much lower than the ones farmers could obtain upon harvest (Tab. 4). High turn-over businesses are usually based on plantation crops, and the lower turn-over businesses usually engage in food crops. Fruit and vegetables are increasingly important.

Table 4 Type of commodity per quartile

Turnover	Plantations	Food crops	Fruit and veg.
First quartile	95%	0%	5%
Second quartile	37%	37%	26%
Third quartile	22%	50%	28%
Fourth quartile	22%	56%	22%
Total	45%	36%	19%

Source: field surveys, 1987.

The quality of the agricultural products on the farm is often very poor. At present, the farmers have no reason to improve the quality of their production, as there are no precise standards of quality or differences in the merchants' offers according to the value of the products.

The absence of precise trade standards favours the merchants and not the farmers. Since their efforts are not encouraged by higher prices, the farmers do not invest in correct post-harvest practices. This further benefits the merchants, who have yet another reason to reduce their offers to the farmers, because of poor quality.

The major part of this report is extracted and translated from the dissertation paper *La commercialisation du riz, du manioc et du cafe dans la province du Lampung: Marches locaux et cultures d'exportation, une nouvelle donne avec la TRANSMIGRASI attended at the Ecole Nationale Superieure d'Agronomie de Toulouse* by Eric Mougeot for the obtention of the diploma of *Ingenieur Agronome.*

Introduction

In order to relieve the overpopulation in the rural areas of Java, where densities have reached 800 to 1,000 inhabitants per km^2, the Indonesian government set up a vast transmigration programme which purpose is to assist in the resettlement of the populations in the less-inhabited regions of the archipelago, where the natural resources have remained relatively undeveloped. Since 1980, ORSTOM (Institut Francais de Recherche Scientifique pour le Développement en Coopération) has been working with the Ministry of Transmigration*, participating in numerous field enquiries, the results of which are exploited by the Planning Office of this same Ministry.

In the beginning, these surveys concerned regions that had been newly-opened to transmigration. At present, their orientation has been shifted to zones in which organized population resettlement has been carried out over a considerably longer period, beginning in 1905 under the Dutch colonial government. From 1980 to 1983, ORSTOM studied possible locations for transmigration centres in South and West Kalimantan (soil analysis surveys and cartography of the projected regions). Since 1984, ORSTOM has been preparing a regional synthesis for Lampung, evaluating 80 years of spontaneous or organized transmigration.

Objectives

Carried out under the bilateral co-operation agreement between ORSTOM and the Ministry of Transmigration, this memoir is the result of field surveys made in the province of Lampung, South Sumatra.

Its theme is "The Commercialization of the Lampung Agricultural Production", and is based on three crops destined for national consumption as well as export: rice, cassava, and coffee.

A few explanations will reveal the reasons for this change of plan. The study, in order to be more complete in terms of trade channels, required numerous trips both to the production regions and to the provincial capitol of Bandar Lampung (500,000 inhabitants). Thus it could not be limited to the regions controlled by the 3 districts of Pringsewu, Kotabumi, and Metro. Moreover, in 6 months, with a team of 3 interviewers per mission and the necessity of learning Indonesian, it proved difficult to carry out an exhaustive study of all the trade channels by agricultural product, given Lampung's extreme agricultural diversity.

We decided to focus the study on the province's three main agricultural products, each of which represents a major type of organization of production and trade.

The first product chosen was rice, which has been grown in Lampung in irrigated conditions since 1930 and which constitutes the basis for food self-sufficiency in Indonesia. With respect to the transmigration policy (in terms of regional development and the transmigrants' income level), it was important to pin-point the constraints

* See appendix I and II for a presentation of transmigration objectives

present in the commercialization of rice in the former colonial zone of the province, and find in these regions, where infrastructures and services are well-developed, pilot solutions that can be applied to the transmigration projects.

The second product chosen was cassava, which was grown on a large scale at a later date since the 1970's with the implementation of the transmigration programmes in the Lampung area. As it has proven more resistant than rice and maize in the unfavourable pedo-climatic conditions that are often found on the transmigration areas, cassava is a reasonable substitute in the subsistence farming practiced on the sites. But as prices are more favourable due to the 1983 and 1986 devaluations, it is now becoming a cash crop destined both for the national market (tapioca) and for export (cassava chips and pellets for animal feeds). This results in more complicated systems and trade networks, which can have negative (or positive) effects on the transmigrants. It was therefore important to determine to what extent the improvements made in the rice trade could be applied to cassava or if it would be necessary, to find specific solutions for cassava.

The third crop chosen was coffee, the most developed plantation export crop in Lampung. Moreover, the analysis of this channel provides an understanding of the development problems related to spontaneous migration. Indeed, the production and marketing conditions were brutally affected by the rocketing of the coffee prices in 1977. Coffee was traditionally grown by Sumatranese ethnic groups before that date, but this rise in prices provoked the immigration of a large number of spontaneous migrants, principally from Java. These migrants, who did not benefit from the governmental transmigration program, settled in particularly isolated zones in which trade conditions are especially precarious.

Table 5 summarizes the variety of the aspects behind the study of the trade channels for rice, cassava, and coffee.

Table 5 Situation of rice, cassava and coffee trade channels.

CHANNEL	TRANSMI-GRATION	INFRA-STRUCTURE	TYPE OF CROP	MARKET
RICE	- established 1905-1942 - densely populated (800/km^2)	- irrigation developed - large asphalt road network	- yearly - subsistance in non-irrigated zones - intensive and commercial in irrigated zone	- local - region
CASSAVA	- recent 1955-1985 - pop. density medium to low (200/km^2)	- few irrigation projects - limited road network	- yearly extensive assoc. with rice and maize	- local - region - export
COFFEE	- very recent 1977 to now - pop. density (50/km^2)	- no 4-wheel motor access - motorcycle or on foot	- plantation - extensive commercial agriculture	- nation - export

Source: ORSTOM field surveys, 1987.

Methodology

The absence of recent and reliable data on the existing businesses and their economic activities is the major constraint to any field survey in Indonesia. In our case, we had to study a sector whose structural organization was particularly loose, that of the commerce of farm products. This seasonal activity, which is often of a part-time nature, is carried out by a very large number of small-scale collectors who are not very specialized in a particular type or production of geographic zone.

Without the possibility of carrying out at statistical sample of the population concerned under correct conditions, we concentrated on understanding the systems under which the channels operate, from the viewpoint of the agents themselves.

Through the use of the available official documents (production per subdistrict, yearly documents published by the Provincial Statistics, Bureau in Bandar Lampung) we defined the major production zones, which provided a basis upon which to begin the surveys of the merchants and farmers.

After defining a schedule of interviews to be carried out per subdistrict, the methodology used in Lampung was determined in part by the second major constraint inherent to any fieldwork in Indonesia: addministrative formalities that must be met once any decision to work outside of Jakarta has been made. Upon arrival in the province, one must first visit the Social and Political Office (*SOSPOL*) of the Ministry of the Interior, to present the research authorization granted in Jakarta (obtained after a 10 to 15-day waiting period). The document obtained allows one to move progressively towards the mission's objectives, after successively contacting the administrative authorities at the district, subdistrict, and village levels.

During these obligatory visits, we carried out a rapid informal enquiry (from 15 to 30 minutes long) allowing us to orient our research. At the district level, this was to confirm or change the schedule of interviews to be done per subdistrict, which had been elaborated in Jakarta, far from the realities of the field.

At the subdistrict level, the information required took on a more precise nature. The lists of villages, of collective commercial or supply structures, and agro-industries, were drawn up with the *Camat* , or head of the subdistrict. Information on the principal productions in the subdistrict, where they were found, and the qualitative commercial flows was also gathered. Even though the subdistrict statistical documents can easily be consulted, they are rarely more helpful than the type of interviews that were carried out. The statistical data collected are not very reliable, however; while they indicate the presence or absence of a crop, any closer interpretation must be done with great care.

Having drawn up the list of interviews to be done per subdistrict, corrected by the information gathered from the local authorities, the choice of the villages in which the surveys were to be carried out remained to be made. This choice was based on the following reasoning: the greatest number of producers and small-scale merchants of product X will be found in the villages in which this product X is produced in the largest quantities. Given the information and the contacts acquired at this first level, we progressively moved up the scale of the larger merchants on the subdistrict level, then onto the district and finally the regional levels.

The choice of the villages and interviews according to this method could in itself be strongly criticized, and this constitutes a limit to the precision of the field survey.

The official statistics' lack of reliability, as well as the absence of precise data on the number of commercial enterprises and their activities, are both hindrances that, when combined with the frequent obligation to report to the authorities and the lack of time, forced us to adopt this strategy whose many limitations will be pointed out further on in this report.

Upon arriving at the village, the interview with the *kepala desa* or mayor, provided information on the number of merchants and types of agricultural products. Here again, the choice of interviews was a difficult one: how can a random sample be taken when of the 8 or 10 merchants concerned, 3 are making their rounds and 2 are working in their fields? The lack of time and the difficulty of making appointments (there are no telephones..) prevented us from waiting or returning the following day.

Interviews with the merchants lasted from 30 minutes to 2 hours, according to the size of their business and their knowledge of the market. Few persons (3 out of 90) either refused to be interviewed or deliberately falsified their answer. Despite the confidence manifested by those concerned, it was difficult to obtain precise numerical information. Thus questions such as: "What was your annual turnover for coffee in 1987 and its evolution over the past three years?." often received answers beginning with: "At the height of last year's season, I would buy 15 to 20 bags per day .....", for the simple reason that the interviewed did not calculate in precise terms, as he did not see any use in doing so.

In Lampung and its capitol, the commercialization surveys allowed information to be gathered from 90 of the 10,000 merchants concerned operating in the province:

- 30 coffee merchants
- 15 rice merchants
- 15 cassava/maize merchants
- and 30 from other agricultural marketing sectors (10 from the "other plantations" sector, 15 from the "fruit and vegetables" sector, and 5 from the "other food crops" sector; see Tab. 6).

Table 6 Estimated number of traders in rice, cassava and coffee sectors.

	RICE	CASSAVA	COFFEE	TOTAL
Village collectors	4500	1500	1000	7000
*Kecamatan**	1600	300	550	2450
Wholesalers, Exporters	350	100	150	600
TOTAL	6450	1900	1700	10050

Source: field surveys, 1987.
* Subdistrict

The surveys were completed by interviews made of members of the district, regional, and national administrative personnel of the different Ministries involved, by visits to agro-industrial units and to plantations, and by interviews made of the directors of co-operative organizations.

Limits of the Methodology in Terms of Quantitative Results

Having to set aside the sampling rules and techniques that are usually employed when preparing and carrying out surveys creates a serious doubt as to the reliability of the data obtained, and this must be kept in mind throughout this report.

Moreover, many practical constraints must be added to the above-mentioned methodological problems:

- the field survey was carried out in four and a half months, and the data is homogeneous up to a point,
- the difficulty of communicating in Indonesian may have, despite many repetitions and the presence of MOT personnel, led to errors in interpretation.

The principal constraints already mentioned (absence of reliable and up-to-date data, difficulty in obtaining precise quantified information during interviews) take away from the authenticity of the quantitative results obtained, whether they concern the sector in general or the merchants in particular. These handicaps, combined with the limited investigation methods, only leave a small place for rigorous survey methods.

However, due to the survey results of the merchants, it was possible to reconstitute the price chains and their breakdown for various commercial options in the rice, cassava and coffee sectors. Despite the relative error factor within the data (10 to 20%), their precision suffices to compare and classify these options according to their economic effectiveness for the producer.

Given these problems, we concentrated our interviews on collecting qualitative information from the merchants, notably through repetition. Any "suspicious" information was verified during successive interviews. On this same line, asking the same delicate questions of other economic agents who were not as directly concerned allowed us to obtain an idea of the conditions and actual costs of the commerce in agricultural products in Lampung. Nevertheless, the data provided in this report must be considered critically and carefully.

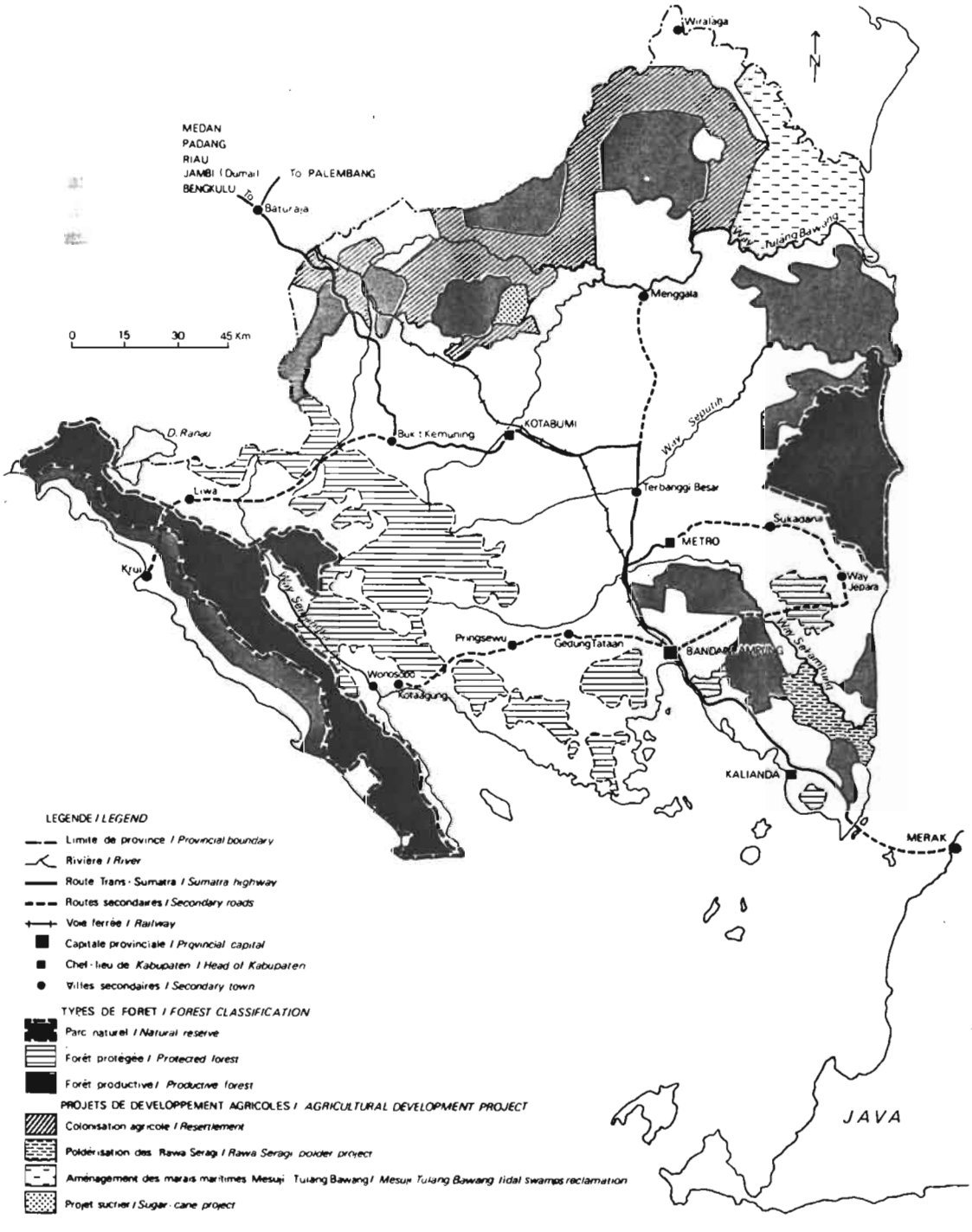

Figure 2 Forested Areas and Agricultural Development Projects in Lampung
Source: NACHER J.P., IGR, 1985.

1

The Province of Lampung

The Late Colonization of Lampung

From the Trade Wars to the Dutch Colonization: 1500-1857

Located at the extreme southern tip of the island of Sumatra, the province of Lampung was colonized quite late, in 1857, by the Dutch. In the 13th and 14th centuries, Islam gradually spread from the northern regions of Sumatra to Lampung and Java, through the intermediary of the Arab merchants. It was not until the 16th century that the first European traders sailed to Southeast Asia and began regular trade relations. On Sumatra, they set up their spice counters on the west coast, which at the time produced great quantities of pepper. The enormous financial impact of this trade led to a struggle between the Dutch, English, Portuguese, and French companies. The attractive benefits that could be had encouraged the merchants and launched the second phase of the colonization process. Thus, on the southwest coast of Sumatra, the English built Fort Marlborough, in the present-day province of Bengkulu, and progressively set up the first system of forced pepper cultivation.

In 1602, the Dutch set up the *Vereenigde Oost-Indische Compagnie (V.O.C.)*, or Dutch East India Company. They established a very favourable relationship with the Sultan of Banten (West Java), who was at the time ruler of Lampung. The Dutch bought pepper from the Sultan, who personally organized its collection and transport in Lampung. This system resembled a sort of tributary payment to be made in pepper by the farmers. In 1662, in recognition of services rendered during a "palace revolt", the *V.O.C.* succeeded in obtaining the monopoly on the pepper market in the Banten sultanate.

The extremely dictatorial regime imposed on the inhabitants of Lampung led them to sell their pepper to the agents from the Palembang sultanate and to the English ships sailing in Semangka Bay, in the southwestern part of the province. The Dutch strategic position began to deteriorate, and their income diminished rapidly. They therefore decided in 1737, to build Fort Valkenoog in Menggala, and to protect it with a garrison of 20 men.

For 120 years, the economic, social, and political situation in Lampung steadily worsened. Malay pirates from Johore and Makassar sailed up the rivers and rampaged through the province. Armed bands terrorized the roads and plundered the villages. Moreover, the rival Sultans of Palembang and Banten who each wished to obtain control over Lampung, organized expenditions in order to affirm their power.

Lampung's Economic Development: 1857-1942

In 1857, the Dutch put a stop to the disastrous situation by setting up a direct administration for the province. By 1858, the first census was carried out, estimating

the population at 83,000 inhabitants. In 1905, the second colonial census counted 156,518 inhabitants: 1,186 Chinese, 146 Europeans, 153 Arabs, 3 Asians, and 155,030 natives. Menggala, located at the centre of the province, near the pepper cultivation zones and on the large navigable road "Way Tulang Bawang", was then the largest town in the province, with 20,000 inhabitants. It retained this position up to the 1920's, due to the lack of other overland routes, as river transportation provided the only form of long-distance travel. The Dutch also built Tanjung Karang, which had only 400 inhabitants at the time.

During this period of relative calm, the province was at last able to undertake its true economic development. Between 1833 and 1879, the cultivation of coffee was encouraged on the west coast (present-day *kecamatan* Pesisir and Balik Bukit). From 1850 to 1900, the inhabitants of the Krui region domesticated several species of *Shorea* (forest "giant" secreting a resin used in the fabrication of lacquers), and set up the world's first *damar* plantations. Beginning in 1885, the Dutch settlers were authorized to open privately-financed plantations. These measures allowed for the extension of industrial crops such as rubber, pepper and coffee. Starting in 1912, the Dutch undertook the construction of the Tanjung Karang-Palembang railroad. Finally, the road network was enlarged and improved, and the first asphalt sections appeared in 1930.

The large amount of labour required by these sizeable development projects was imported from Java and this rapidly accelerated the province's food shortage, for there was no rice-producing region in Lampung at the time. Thus the Dutch decided to implement the *Kolonisatie* solution, ancestor of modern-day *Transmigrasi*. This policy of voluntary migration was began at the turn of the century, and was necessitated by the conjunction of the following facts:

- Certain rice-growing regions on Java were already over-populated, and land access, especially for rice paddies, was becoming more and more problematic for the young Javanese.

In 1905, 155 families were installed in Bagelen, in the Gedong Tataan region, 20 km from Teluk Betung in 1906, 555 more families were resettled, in the nearby colony of Gading Rejo. In 1922, the Dutch placed 870 families in Wonosobo, in a particularly hostile, isolated region. The demographic landscape was being modified and there were already 90,781 Javanese among the 350,500 inhabitants in 1930. At the same time, given the worldwide crises on the raw materials markets, the Dutch decided to accelerate this program in order to obtain food self-sufficiency in the province.

Thus the Metro colony was set up in 1932, with the first massive installation in 1935. After three years of careful study of the pedo-climatologic conditions in the region (soil analyses, water reserves, aerial photography, etc), a particularly successful irrigation network was set up. The results were encouraging and by 1940, the population in the Metro region had surpassed that of Gedong Tataan (47,000 as opposed to 38,000).

Moving Towards Independence: 1942-1965

The Japanese victory in 1942 signaled the end of the Dutch period and imposed a war economy that was very difficult for the local populations (deportations, forced labour, and plundering of the agricultural production for the needs of the Japanese

occupational forces). This situation also opened the way for a period of economic regression, since the infrastructure deteriorated, the plantations were abandoned, and the commercialization network had to be rebuilt.

Beginning in 1950, when independence had been obtained, Lampung's economy was stimulated once again. The transmigration projects of the Soekarno period were centred on the regions to the north-east of Metro, developing both irrigated and dry crops (cassava, maize, soybean). Clove farming was implanted under the increasing demand of the rapidly-growing "kretek" cigarette industries.

Accelerating Economic Development: 1965-1987

The acceleration of the governmental transmigration program, in the region to the north-east of Metro until 1977, then in Lampung *Utara*, led to the cultivation of cassava. The province became the foremost producer outside Java.

The road networks have been improved, a fundamental element for commerce. The "Trans-Sumatra" road is now complete, considerably decreasing the amount of travelling time within the island. In 1977, it took between 5 days and 3 weeks to go from Medan, in North Sumatra, 1,500 km from Lampung, to Tanjung Karang. Today it only takes 76 hours, even during the rainy season. Panjang port was redesigned in order to provide on-quay loading and off-loading of medium-tonnage cargo ships (20,000 to 45,000 tons) carrying cassava, pellets, coffee, pepper, and rubber. A car-ferry service was set up in 1978, which increased the flow of commercial goods, especially perishable goods such as fruit and vegetables, between Jakarta and Lampung. A "hydrofoil" service which would provide transport between Panjang and Jakarta in 2 hours, is presently under study.

Thus, 70 years of development have totally transformed the region. By 1987, Menggala had lost its strategic position as the neighboring towns of Teluk Betung, Tanjung Karang and Panjang have grouped together to become the financial, commercial and industrial centres of the region.

The evolution of the Lampung economy is linked for the most part to the price variations of the agricultural products exported on the world market. Thus the cost of coffee in 1977 led to a new generation of migrants moving towards the mountains in the western part of the province, which obliged the government to defores the area. In 1987, pepper prices skyrocketed, increasing from Rp. 1,800 to Rp. 6,500/kg in two years. The extreme flexibility of Lampung's agriculture and its small-scale producers seems to indicate that, at least for a few years, the province will get back to basics.

The Present Situation

Soils and Climate

Soils

The diversity of soils explains the large variety of agricultural products in Lampung. There are 5 basic types:

- the humic and gley soils of the swampy regions in the eastern part of the province, covering about 10% of the total surface area. The amount of hydromorphic soils is much less than in the regions of Jambi, Riau, and Sumatra *Selatan*, which

explains the limited development of the transmigration centres established according to the IRTF model in Lampung:

- the red-yellow podzolic soils occupy 50% of the total surface area and are found in the eastern peneplains. Poor in organic matter and minerals, they were rarely developed before or during the colonization of the province, except on two occasions: during the rubber boom (1895-1931) and again during the construction of the irrigation network in Metro (1932-1935). Even under intensive farming conditions, the development of these podzolic soils in non-irrigated conditions remains a permanent challenge for producers. If the first season provides subsistence for the farmers, the second harvest depends on the length of the rainy season, which is always aleatory.
- the latosols make up 25% of the total surface area and are situated primarily in the mountainous region (Bukit Barisan) and its eastern foothills (between Bukit Kemuning and Pringsewu). The majority of the coffee is produced on this type of soil. In the low-altitude regions, the farmers carry out rainfed cultivation of rice, maize, and cassava.
- the andosols, which concern 5% of the total surface area, are present only in the Sukadana region, to the northeast of Bandar Lampung. Of recent volcanic origin, these soils are very fertile and the Sukadana plateau is one of the most highly-developed areas in the province (soybean and maize yield three harvests per year; pepper is also cultivated).
- finally, 5 to 10% of the surface area is made up of alluvial soils, a transition between the latosols and the hydromorphic soils of the swampy regions. These soils are relatively fertile and are suitable for many crops once they have been well drained.

Climate

The average monthly temperature is stable the year round, around 26-27°C at sea level and rarely surpassing 35°C at the end of the dry season. The resulting absence of a thermal season, and a relatively high hygrometric level, always greater than 80%, theoretically allows for two crops per year in many zones. At higher altitudes, the drop in average temperature (0.6°C/100 m) brings about a simplification of the farming systems, which are oriented towards coffee and European vegetables.

There are three basic rainfall patterns in Lampung:

- the western coastal regions receive an annual rainfall of 4000 mm, evenly distributed through the year. However, the rainfall here is quite violent, which leads to rapid erosion and leaching of the soil's nutritive elements;
- as soon as the western cordillera of Bukit Barisan is passed, the rainfall drops to 300 mm/year in the rift. There is no marked dry season;
- in the rest of the province (peneplain and swampy regions to the east), the climate is characterized by the two alternating season (1,750 to 2.500 mm/year). The duration of the dry season, from May-June to September-October, depends on the arrival of the monsoon, which can vary greatly from one year to the next.

Conclusion

The pedo-climatologic conditions as a whole allow one to distinguish 5 sub-zones,

which divide the entire province:

- the western coastal band (5% of the total surface area, Krui coast), which has a suitable rainfall pattern, but where the soil is not very fertile. Here, coconut, cloves, and rice are grown;

- the mountainous zone (25% of the total surface area, in the Bukit Kemuning-Wonosobo axis), with relatively fertile soils and a limited dry season. This is the best area for coffee;
- the eastern foothills (15% of the total surface area, in the Bukit Keming-Pringsewu axis), whose soil is usually less fertile, and where the dry season lasts 3 to 4 months. Crops are very diversified, oriented both towards plantations (pepper, coffee in the more fertile regions west of Kotabumi, and rubber north-west of Menggala), and food crops (maize and cassava);
- the large peneplain (45% of the surface area), covering the regions east of the Teluk Betung-Menggala axis. Despite difficult pedo-climatological conditions, the majority of the transmigrants have been resettled here and cultivate extensively rainfed rice, maize, and cassava. Two sub-zones stand out from this geographic sector: the Metro zone, whose rice-cultivation development has modified the farming conditions, and the Sukadana region, with its fertile soils; and
- the swampy coastal zone in the east (10% of the surface area), little-developed up to today, except in the southern part.

Demography

Generalities

Lampung is one of the Indonesian provinces with the highest demographic growth rate over the last 130 yeras (Tab. 7).

Table 7 Lampung's population from 1858 to the present

Year	Population	% Javanese
1858	83,000	0
1905	156,500	1
1931	365,500	25
1961	1,577,000	45
1971	2,540,000	57
1981	4,625,000	74
1987	6,475,000	78

Source: 1981 census and MOT, 1987.

The demographic weight of the province with respect to Sumatra as a whole, is continually increasing. From 1961 to 1987, Lampung's population increased from 12% of the total Sumatranese population to 19%. Over the last two decades, its growth rate has been 5.5% per year, as opposed to 3.1% for the entire island. Whereas the average density on Sumatra is 72 inhab/km2, in 1987 this surpassed 192 inhab/km^2. Intraregional differences remain quite marked. In the Pringsewu and Metro regions,

densities are around 700 to 800 inhab/km^2, as opposed to 250 and 50 respectively for the more recent transmigration zones in the mountainous areas. But these differences are decreasing every year, given the internal migrations within the province. This is the case for the *kecamatan* of Mesuji and Menggala, where nearly 50,000 families of coffee farmers living in the west of Lampung *Utara* and Lampung *Selatan* were resettled from 1980 to 1987. While the density was only 4 inhab/km^2 in these *kecamatan* in 1975, 12 years later it had reached 70 inhab/km^2.

If a natural growth rate partially explains the demographic growth in Lampung during the 20th century, the main reason for this permanent boom still remains the intensity of the migrations between 1900 and the present. Without these displacements, originating mainly from Java, the province's population would only be 1,400,000, while at the end of 1987 it had reached 5,250,000 inhabitants.

Transmigration in Lampung

A few key periods in the history of population movement in Lampung stand out:

- 1880-1930: migrations of Javanese and Sumatranese farm labourers for the Dutch plantations and the large-scale development projects;
- 1905-1940: Dutch *kolonisatie* in the southern part of the province (Metro, Pringsewu, Wonosobo);
- 1965-1980: Transmigration to Lampung *Utara*, north of Kotabumi and Menggala (Tab. 8);

Table 8 Sponsored transmigrants in Indonesia

Year	Sponsored transmigrant (1971-1980)	(1980-1985)	% of popul.	Contrib. to pop. growth
Lampung	133,300	188,200	5%	13%
Sumatra	487,800	1,035,300	5%	21%
Kalimantan	103,700	388,600	6%	37%
Sulawesi	137,100	211,400	3%	19%
Irian Jaya	10,600	75,600	6%	19%
Total	743,500	1,753,900	4%	25%

Source: MOT, 1986.

- 1979: end of official transmigration in Lampung *Selatan* and *Tengah*;
- 1980-1987: intra-provincial migrations to Lampung *Utara*, aided by the regional authorities.

The principal causes of these vast population movements are the short distance from Java to Sumatra, the transmigration policy, and perhaps even more important than for the other host regions, the attraction the governmental programmes had for spontaneous migration.

Although today only 5% of the population has the official status of transmigrant, 74% of the population speaks Javanese, having originated either directly from Java or descended from Javanese settlers. This shows the intensity of the spontaneous migrations to the province (Tab. 9).

Table 9 Spontaneous migration as measured by language spoken at home

Region	Inner language speakers	Sponsored migrants	Total population	% of sponsored	% of spontaneous
Lampung	3,400,800	350,400	4,624,600	8.0%	66.0%
Sumatra	6,615,000	1,009,000	27,995,900	4.0%	20.0%
Kalimantan	502,500	192,800	6,716,900	3.0%	4.0%
Sulawesi	202,200	188,200	10,400,300	2.0%	0.5%
Irian Jaya	7,000	6,600	1,507,200	0.5%	0.5%
Total	7,343,700	1,406,300	50,365,900	3.0%	12.0%

Source: Agricultural census, 1981.

Today, the migration process has arrived at maturity in Lampung. As on Java, the former host regions are overpopulated. Many young people are now migrating to the interior of the island towards new pioneer zones in order to look for land and work (Tab. 10).

Table 10 Assisted transmigration to Lampung from 1905 to present

Period	Number of migrants
1905-1961	622,000
1961-1971	187,000
1971-1980	133,000
1980-1986	251,000

Source: Mot, 1987.

Development of the Province

Infrastructure

During *REPELITA III,* the government transmigration policy led to an increase in the provincial road network. This development gave Lampung the greatest number of roads in all of Sumatra: 228 m/km^2 as opposed to 160 m/km^2 in 1985 (Tab. 11).

The effort helped provide communication routes for many transmigration centres, but the situation is still precarious in Lampung *Utara*, as there are no asphalt roads north of Menggala, where nearly 400,000 persons live. The amount of time needed for travel in the dry season can reach 5 to 6 hours for about 100 to 150 km.

In general, the road network is in poor condition. On the "Trans-sumatra" driving speed is at best 45 km/h; on the best district roads the maximum possible speed does not exceed 25 km/h, and 10-15 km/h on the village access roads during the dry season.

Any rapid improvement of the network is hindered by several problems. Maintenance is done by private companies who, through lack of the necessary financial means or technical abilities, cannot carry out their operations properly. Moreover, the maintenance sites for a single road are distributed among different contractors; if one of them goes broke, its sector will not be maintained for one to two years, which allows the road to deteriorate seriously in that place. Finally, the private transport companies overload their vehicles in order to make the maximum profit on their trips, and this accelerates the deterioration of the communication routes.

Table 11 Road networks in Lampung and Sumatra

Roads in km	Lampung	Sumatra
National network	2,007	22,186
Provincial network	2,589	41,317
Transmigration roads	3,001	12,801
Total	7,597	76,204
% growth	39%	17%

The consequences for the farmers are predictable. The more isolated the farmer is, as is the case in the northern part of the province, the more the transport costs will rise and force him to continue extensive subsistence farming.

Agriculture in Lampung

Generalities

Agriculture is the primary economic activity of the province, and concerns 87% of the active working population, providing 80% of the income in the rural zones.

The farms are modest in size, with 0.7 ha per farm, because the cultivatable farming area only covers 23% of the total area, to wit 775,000 ha. In this, the province resembles Java more than Sumatra, where population densities still remain low and where the surface area per farm reaches 1.5 ha. The agricultural activity in Lampung, which is extremely diversified, is essentially the domain of small-scale farmers, with plantations remaining in the minority though rapidly growing at present (hybrid coconut, oil palm, and cloves in the Teluk Betung region; cassava and rubber with an agro-industrial unit in the northern area of the large peneplain; see Tab. 12, Fig. 2, 4, 5 and 6).

Table 12 Major crops in the Lampung Province (average yields and productions)

	Yield (t/ha)	Production (t year)	Surface (ha)
Food Crops			
Rice (irrigated)	3.80	610.000	160.000
Rice (upland)	2.20	490.000	223.000
Maize	1.30	100.000	770.000
Cassava	9.00	1.000.000	1.250.000
Soybean	0.50	15.000	30.000
Tree Crops			
Coffee	0.50	80.000	160.000
Pepper	0.80	20.000	25.000
Rubber	0.30	6.500	22.000
Cloves	0.16	2.000	12.500
Coconut	0.30	30.000	100.000

Source: SCHOLZ, 1984 and MOA provincial Statistics, 1984.

As a general rule, the farmers in the populous southern zones carry out intensive farming and sell most of their crops in Teluk Betung. Infrastructures and services (financial, extension, and commercial) are well-developed here. On the other hand, the farmers in the north of the province have set up systems oriented towards subsistence farming and food self-sufficiency.

Agriculture in the province depends primarily on vegetable production. The growth of meat production is recent and its part in the incomes of Lampung farmers is still limited. By order of the quantities produced per year, rice and cassava are the major food crops and coffee the principal plantation crop. The importance of these three crops for Lampung's economy is one of the reasons behind their selection for this commercialization study.

Rice

Rice, the age-old agricultural basis of Java, was introduced quite late in its irrigated form in Lampung, during the massive Dutch development schemes at the turn of the century. The objectives of this period of ensuring food self-sufficiency for this province which was undergoing rapid demographic growth due to the migrations from Java, remain just as important today (Fig. 3 and 4).

By 1987, the farming, marketing, and consumption conditions had completely changed. The arrival of road transportation and the agricultural intensification, are recent additions that have both contributed to the changes in the province's rural economy.

First felt on the national level, these modifications affected the regional level as early as 1978, with the reforestation and the closing-off of the fragile mountainous zones, which had been massively colonized after the 1977 coffee boom. The concerned populations who wished to do so, were resettled in those very poor zones of north Lampung, which since 1980 has been a new region in which there is a shortage of rice (since then, nearly 250,000 persons have been sent there).

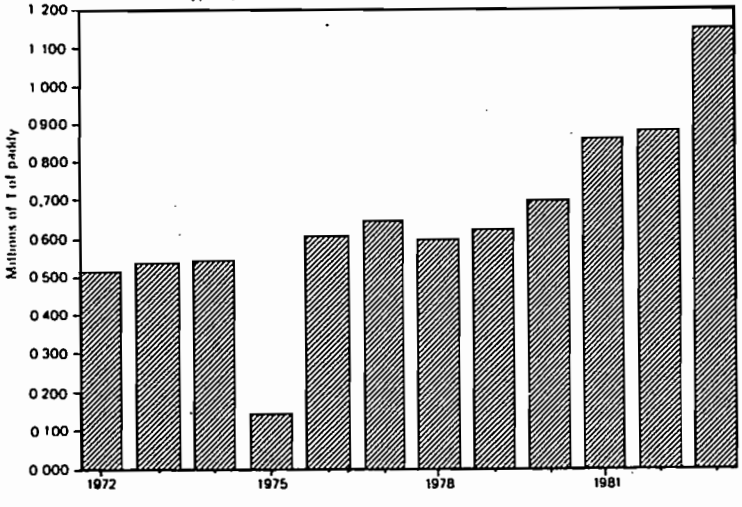

Figure 3 Rice Production in Lampung, from 1972 to 1983
Source: Lampung Dalam Angka, annual provincial report, 1983. Biro Pusat Statistik, Teluk Betung.

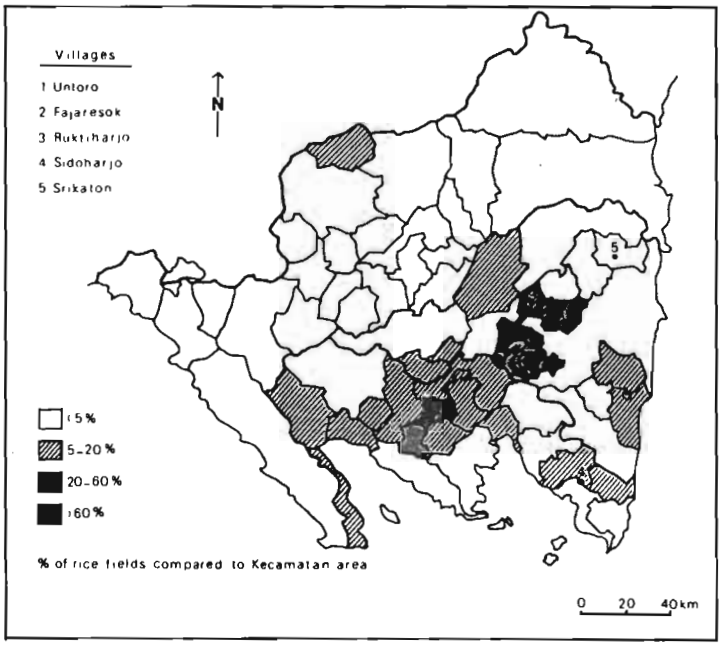

Figure 4 Major Rice Producing Areas of Lampung
Source: ORSTOM Jakarta, Olivier SEVIN, 1984.

In the future, Lampung will face a problem of rice self-sufficiency as will Indonesia in general. This objective requires the development of new irrigation networks that are less and less profitable as increasingly poorer land is developed.

While Indonesia has been obliged since 1985 to make budget restrictions, the difficulty of defining the national agricultural policy is arising. Would it be best to orient the agricultural economy towards plantations and export crops, with the risks of drops in the world prices, or to set up a system of subsistence farming that would be protected from the world market and whose trade would be controlled?

Meeting the food requirements of the population is one of the means to ensure the national social and political balance, by realizing the difficult distribution of the resources between the urban consumers and the farm producers (Tab. 13).

Table 13 Nutritional value of rice, cassava and maize

	Edible	Kcal g	Protein 100g	Water cont.	Price Rp kg
Paddy	100%	3.59	7.1%	13%	220
White rice	100%	3.60	6.7%	13%	370
Maize	100%	3.56	9.5%	12%	220
Fresh cassava	80%	1.46	1.2%	63%	80
Dry cassava	100%	3.38	1.5%	14%	170

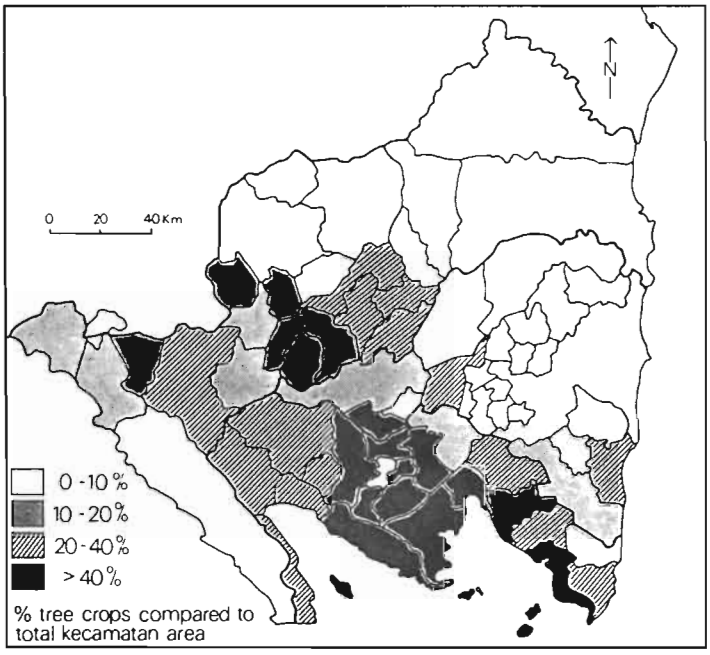

Figure 5 Major Tree Crop Producing Areas of Lampung
Source: O. SEVIN, 1984.

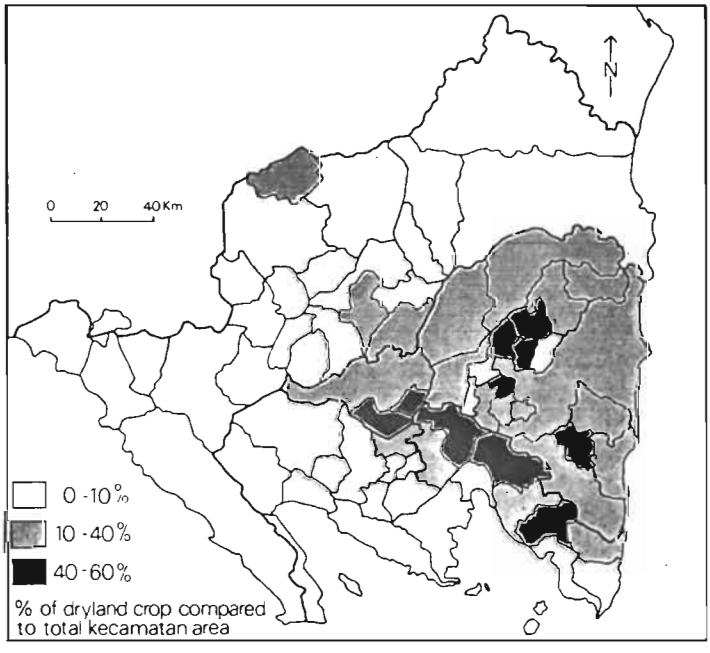

Figure 6 Major Dryland Crop Producing Areas of Lampung
Source: O. SEVIN, 1984.

Cassava

Introduced since the 1650's with imported roots from Mexico, cassava has acquired a significant place in the agricultural system of South-East Asia during the last century. Indonesia was the leading exporter of tapioca before World War II and it remains the world's fifth largest producer, with 13 million tons of fresh cassava produced per year, behind Thailand, now both leading world producer and exporter with 21 and 14 million tons (15 million for Brazil and Zaire).

Contrary to the latter, Indonesia, with its 170 million inhabitants, still consumes 90% of its production. Fresh cassava makes up the basis of the meals in the poor regions of East and Central Java. The tapioca industry uses about 25% of the total production, which is essentially destined for national human consumption (Tab. 14 and 15).

Table 14 Major utilizations of Indonesian cassava

	Fresh tuber equivalent (tons)	Part of production	Production (ton/year)	Utilization
Fresh cassava	9,250,000	65%	9,250,000	Direct consumption (see table 15)
Tapioca	3,250,000	25%	650,000	Direct consumption: 10% Snacks: 65% Other industries: 20%
Pellets, chips	1,500,000	10%	600,000	Exportation

Source: CIAT, 1984 and ORSTOM surveys, 1987.

Table 15 Cassava preparation for human consumption

Method of preparation	Product obtain
Cooked in oil or steamed	Field or boiled cassava
Fermentation	*Tape*
Cooking, cutting up and drying	*Kripik, oyek*

Source: ORSTOM field surveys, 1987

The remaining 10% is exported as chips and pellets to the EEC and as cassava flour (tapioca) to the USA and Japan.

Second upland crop after maize in terms of surfaces cultivated, cassava was first grown in Java on fertile land, then progressively displaced to the less fertile zone, as it is more resistant than maize to extreme pedo-climatologic conditions (poor acid soils and long dry seasons).

Today Java is still the main centre of production with 70% of the total production (13,000,000 tons of fresh roots per year). Lampung has undergone a very rapid development of this crop. Since 1970 it is the foremost production region outside of Java, due to the extension of the transmigration programmes.

Cassava is grown under particularly extensive conditions in Lampung and in the outer provinces. The cassava farmer is often a Javanese transmigrant who has small, infertile plots of land. With no capital in the beginning and no assistance programme

(such as *BIMAS* or *INMAS* for the rice sector), this transmigrant cannot improve his farming techniques. He uses little fertilizer, high-yield pesticides or varieties, which prevents him in return from increasing his income level, thus from investing in means of production.

To this financial constraint -the impossibility of earning sufficient profit to invest-is added the often extreme isolation of many transmigration centres on Sumatra and Kalimantan, where access is difficult even during the 4 to 6 months of the dry season. The difficult roads made the transmigrants even more vulnerable to the transporters' and the merchants' price demands.

In fact, the cassava market is still subject to very great price fluctuations from one season to the next. There is a constant imbalance between supply and demand, especially in these new production regions like Lampung, where the cassava sector is not yet stabilized. Thus in November 1984, when fresh cassava could be bought at the farm for 9 Rp/kg, the farmers did not even bother to harvest their crops and let them rot on the ground as fertilizer. The result was predictable, the farmers became wary, and the production progressively dropped until 1986, when supply became insufficient. Farm prices skyrocketed to 70 Rp/kg at the end of the year, all the farmers announced they would plant cassava in 1988, and thus a new cycle has begun ... (Tab. 16 and 17).

Around the small rural villages, cassava farming is becoming more intensive, given the nearby markets for fresh roots: their transport costs, which makes up a large part of the final consumer price, is relatively low.

Table 16 Monthly production of rice, maize and cassava in Lampung, 1983

Month	Rice (ton)	Maize (ton)	Soybean (ton)
January	3,443	7,381	104
February	29,040	24,657	1,857
March	209,229	42,724	3,759
April	348,077	4,034	139
May	209,718	4,182	183
June	97,922	14,700	2,758
July	64,932	15,487	1,880
August	87,075	13,248	462
September	44,021	4,180	85
October	25,872	1,067	169
November	21,149	985	79
December	8,033	2,211	73
Total	1,148,511	134,856	11,548
Surface (ha)	216,064	87,678	19,414
Yield (t/ha)	5.3	1.5	0.6

Source: Dinas Pertanian Lampung, 1984.

Table 17 Rice, maize and cassava production in Lampung (1972 to 1983)

Year	Rice (ton)	Maize (ton)	Soybean (ton)
1972	513,990	78,690	18,270
1973	538,150	114,980	34,990
1974	543,350	91,850	34,200
1975	144,570	30,010	30,805
1976	606,070	43,520	22,950
1977	643,960	61,700	28,060
1978	595,700	64,660	28,570
1979	623,090	84,730	21,410
1980	694,720	75,120	15,620
1981	859,660	96,650	33,680
1982	880,760	77,220	12,070
1983	1,148,520	134,860	11,550
Annual growth	7.6%	5.0%	-4.1%

Source: Dinas Pertanian Lampung, 1984.

Coffee

Coffee has been grown for a long time on Lampung. As early as 1833, the natives and immigrants from Sumatra *Selatan* set up coffee farms under the Dutch *kultuur stelsel*, system of forced cultivation.

Beginning in 1879, coffee farming was no longer government controlled and the first private Dutch plantations were set up. The end of the century was marked by a drop in production. Serious epidemics ravaged the *Arabica* plantations and led to their progressive replacement by the more resistant *Robusta* plants.

Moreover, Indonesia did not regain its 1850 production level of 100,000 tons per year until 1925, and then only for a few brief years. The 1929 crisis, World War II, the struggle for independence, and the quest for national unity totally destroyed the coffee industry, which in 1961 produced only 19,000 tons.

After 1961, coffee as a cash crop began to show a regular improvement. Lampung progressively became the primary coffee production region in Indonesia, with an average 80,000 tons during the 1980's from a national total of 390,000 tons per year. After the serious 1977 freeze in Brazil (foremost world producer with 35% of the market), the price of coffee rose from US$ 2.82 to $ 4.93 per kg for Robusta, on the spot market in New York between 1976 and 1977. Many Javanese who had come as farm labourers for the harvest set up their own farms and actively opened secondary forest in Lampung, creating a new coffee boom (Fig. 7).

Moreover, the commercialization conditions were radically changed and made more difficult, since the new production regions had no infrastructure.

Faced with serious ecological risks (rapid deforestation, erosion of sloping terrain, flooding in the restricted zones), and in a flooded world market controlled and dominated by the exchanges between Brazil and the USA (foremost consumer with 28% of the world consumption), the government reacted by creating a protected natural reserve as well as a great many restricted zones in the Bukit Barisan area. It is theoretically forbidden to set up coffee plantations in these areas and the populations

in the zones concerned were resettled if they so wished (*translok*). in Lampung *Utara* (*kecamatan* Mesuji and Menggala).

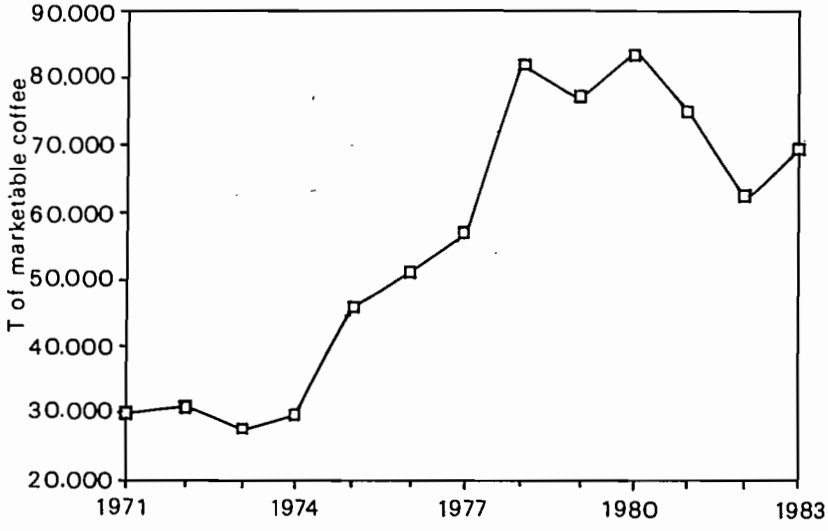

Figure 7 Coffee Production in Lampung from 1971 to 1983
Source: Lampung dalam angka- annual provincial report 1984. BPS

In this context, which is economically unfavourable to coffee farming, the regulation on deforestation hinders and thus limits the extension of coffee cultivation in Lampung.

There are two large coffee-producing zones in Lampung, both producing only Robusta. The high-altitude region above 500 meters is located mainly in Lampung *Utara*. This includes a large part of the *Kecamatan* on the Liwa-Bukit Kemuning axis and the extreme north-west of Lampung *Selatan*. This area produces large-grain coffee of greenish-yellow colour, destined for the international market place. Coffee has been grown here since 1833, but the plantations are usually recent and frequently renewed. The foothills region is, on the other hand, located on the eastern slopes of Bukit Barisan. The climatic conditions (higher temperature and hygrometry) are less favourable to Robusta. Moreover, the post-harvest treatments, carried out both by the farmers and the merchants, are carelessly done. The quality of the coffee is affected, the grains are small, blackened, and often pierced with holes. This production covers, as a rule, the national market.

Other Less-important Crops

Associated with rice and cassava, maize is cultivated extensively by many tranmigrants in the northern part of the peneplain (from Kotabumi to Menggala). To the south, on the Sukadana plateau, the pedo-climatic conditions allow up to three crops per year and the proximity of Teluk Betung provides a sure outlet through the chicken feed industry and human consumers. 100,000 tons of maize is produced per

year, a drop with respect to the 1970's, due to devastating mildew attacks in 1974 and to the replacement of maize, in the regions with poor soils, by the single-crop farming of cassava.

On the other hand, soybean farming, which has stagnated since the 1970's, is primarily located on the Sukadana plateau, where the pedo-climatological conditions are perfectly suited for it. The fertile, well-drained soils, and the marked dry season which benefits this crop, make three harvests per year possible. The crops potential for development is great in Lampung, because the major limiting factor in the eastern peneplain, the poor soils, can be easily corrected with reasonable fertilization. But the isolated regions still lack a finance programme and training adapted to this promising crop.

The organization of the fruit and vegetables sector is very dependent on the producers' degree of isolation. The farmers in isolated areas plant vegetables for family consumption. Nearer the towns, such crops can be intensified to meet the strong demand. In the mountainous zones, european vegetables (potatoes, cabbages, green beans, carrots, etc.) or chinese (chinese cabbages, beans, peppers), are developing near the main roads as their export to the urban centres is relatively easy. Thus the Gisting region (pass on the road from Pringsewu to Wonosobo) supplies Jakarta and Teluk Betung, whereas Sekincau (on the Liwa-Bukit Kemuning road) and Liwa supply Baturaja, Kotabumi, Metro, and Bandar Lampung.

Along the "Trans-sumatra" road between Kotabumi and Kalianda, there are a number of fruit orchards (bananas, rambutans, associated with coconut palms and clove trees), whose harvests are exported. The distances to be covered, and the impossibility of obtaining market information before arrival, make this a particularly hazardous trade, and considerably reduce the farmer's share in the final price paid by the consumer.

The second largest plantation crop in Lampung is coconut, generally intercropped with cloves on the Krui coasts, southeast of Wonosobo and Kalianda. Most of the nuts are dried into copra, which is eventually pressed into oil destined for human consumption. The arrival of the hybrid coconut palm, of smaller size but having yields equivalent to the giant varieties, and the steady increase in the national demand, are changing the structure of the sector. Developing the cultivation of coconut palms is one of the priorities of the Indonesian government, in order to ensure the country's self-sufficiency in vegetal fats. Thus the installation of coconut plantations is strongly encouraged, at both the level of the small farmer and at the large national or private plantations level.

Today the province of Lampung is the primary producer of pepper within the archipelago, with 70% of the total, and exports exclusively black pepper. This crop is very difficult to raise from the pedo-climatic point of view; therefore, its production is limited to two fertile, well-drained regions, the Sukadana plateau and the zone west of Kotabumi. The extensive cultivation of this crop, which is essentially done by Sumatranese ethnic groups who settled in these regions at the turn of the century, is one of the reasons behind the extreme variability in the yields from one year to the next (variations with a factor of 2,5 to 3). In 1987, given the tripling of the price paid the producer (Rp 1,800/kg in 1986 compared to Rp 6,500/kg in 1987), pepper will soon be Lampung's main cash export crop (about US$ 90,000,000 in 1987 as opposed to US$ 85,000,000 for coffee).

After a long period in which the area cultivated to rubber decreased, mainly due to the increase in other crops, rubber is undergoing an upswing with the extension of the NES and PMU programmes in Lampung. The crop is developing rapidly in Lampung *Utara* on the peneplain, where the unfavourable pedo-climatic conditions pose no problem to its implementation. Indonesian rubber is very low-quality, due to the farmers' and merchants' careless post-harvest practices. The price conjunctions are very unsatisfactory, and the government is emphasizing improved quality on the farms, through a rapid extension of the PMUs for this crop, which will ensure better economic efficiency for all the agents in the sector.

Table 18 Major tree crop production in Lampung

Year	Coffee (ton)	Pepper (ton)	Rubber (ton)	Coconut (ton)	Cloves (ton)
1971	30,000	14,500	6,500	23,000	3,000
1972	31,129	21,010	5,500	28,000	4,500
1973	27.670	18,880	5.320	30.080	4.190
1974	29.950	18,810	4,570	28,980	3.500
1975	45,560	13,130	7,750	32,110	4,470
1976	50,590	21,100	7,850	34,630	4,950
1977	56.200	23,440	7,940	37,750	6,530
1978	80.840	29,940	8,640	38,840	2,840
1979	75,530	15,000	8,830	40,250	650
1980	82,060	18,210	6,740	42,830	3,210
1981	73,570	18,830	6,600	44,950	990
1982	60,830	17,850	6,040	36,670	510
1983	68,170	16,060	6,090	29,580	3,750
Annual growth	7.1%	0.9%	-0.5%	2.1%	1.9%

Source: Dinas Pertanian Lampung, 1984.

Finally, cloves are suffering from a rapid drop in production. The cause is a virus, for which no treatment has yet been discovered. Certain regions have been devastated in a few years, such as the Krui region where there have been no healthy trees since 1981. Even in normal conditions, the yields are very variable from one year to the next as this crop is still not very well understood. The rising standard of living, and the correlating increase in the consumption of foreign brands of cigarettes, will eventually halt this production, that was for 25 years the best retirement investment in the islands: little work, except during harvest, and great profits (in the early 1970's, the prices surpassed Rp 12,000/kg for an average harvest of 160 kg per hectare).

Agro-industries

The town of Bandar Lampung has almost all of Lampung's agro-industry. The imbalance with regard to the rest of the province is flagrant. The subdistricts have rapidly lost their role in the wholesale trade, with the growth of the regional capitol, due to its coastal location, and have become secondary collection centres. Only a few modern units of primary transformation (5 for tapioca and 2 for rubber) are located within the zones of production themselves, in order to limit the costs of transporting the raw material.

All of the export enterprises (coffee: 80; rubber: 2; cassava: 13; pepper: 40) are in Teluk Betung, for reasons of convenience. The banks, the administrative services, and the commercial contacts are all on the spot. Foreign connections are easy and direct via telephone, telex, or telefax. Controlling the loading is also facilitated due to the proximity of Panjang port (5 km from Teluk Betung). Jakarta is only 35 minutes away by plane (2.5 hours from one centre of town to the other).

Moreover, Bandar Lampung, through which the "Trans-sumatra" and the Palembang railroad run, is an obligatory passing point for many merchants on their way to Java or towards the northern part of Sumatra. Finally, the regional metropolis, with its 550.000 inhabitants, provides the largest regional market for all the consumer products (rice, maize, cassava, palm oil and copra, fruits and vegetables).

Lampung Province is Rapidly Attaining the Level of Economic Development on Java

Favored by the proximity of Java and by an extremely varied agricultural potential, the province experienced the most active policy of transmigration in Indonesia. Today, this process has matured; the zones first colonized (1905-1930) in the south of Lampung provide the largely rural population with infrastructures and services equivalent to those on Java. In the northern part of the region, more recently opened to transmigration (1965-1987), numerous problems hinder the economic development (unfavourable pedo-climatic conditions, insufficient road networks, the farmers' isolation, and the limited technical and financial framework offered to the farmers).

In relation to the objective of rehabilitating the existing transmigration sites, the study of the commercialization of the most representative products of Lampung's agricultural economy (rice, cassava, and coffee), allows one to examine one of the means of improving the farmers' standard of living in many transmigration zones in the archipelago.

2

Rice Marketing in Lampung

Today, the State's role in the commerce of rice is the most developed form of governmental intervention in the agricultural sector in Indonesia.

Two main routes of rice distribution are represented in Lampung. The private sector, through the local merchants, markets nearly 90% of the total production and handles the supply of rice in the province. The public sector, via the KUD (village co-operatives), and the *BULOG*, has different objectives. The principal ones are to ensure an acceptable price for the consumer and food stocks in case of shortages (Fig. 9).

The Private Sector

The Rice Farmer

The production and commercialization of rice in Lampung are clearly seasonal. The farmer generally harvests once a year in April-May. In the Metro region, where the irrigation network is sufficiently efficient, the second crop is harvested in August (Fig. 8).

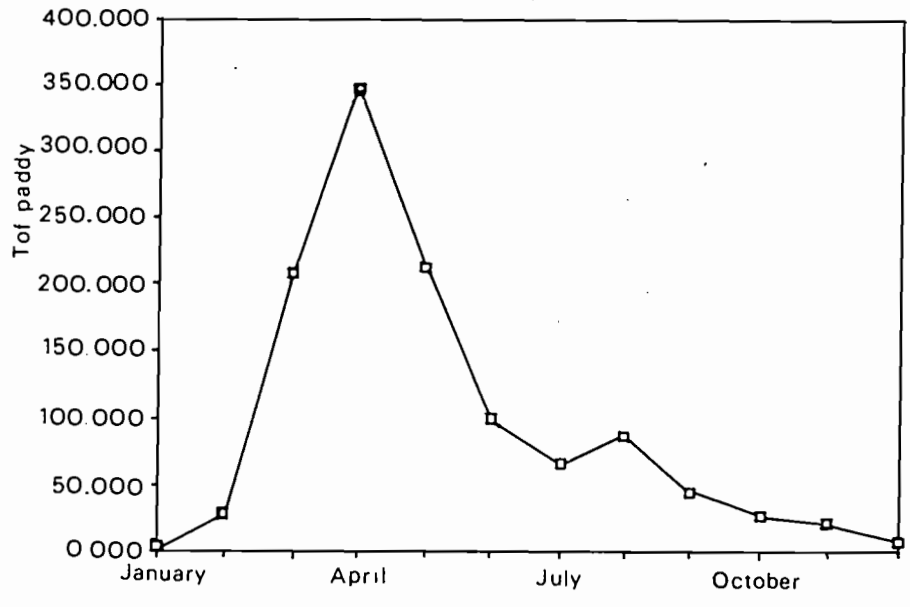

Figure 8 Monthly Production of Rice in Lampung, 1983
Source: Lampung Dalam Angka, annual provincial report, 1983. BPS.

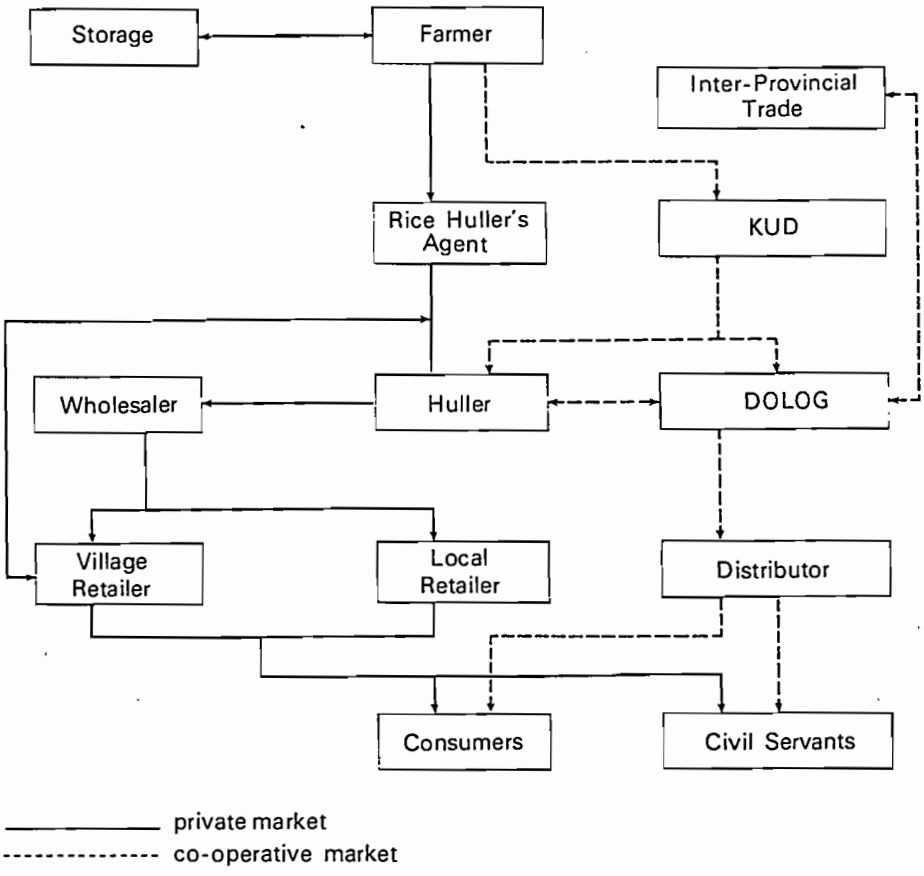

Figure 9 Rice Marketing in Lampung Province
Source: ORSTOM surveys, 1987.

The Case of the Transmigrants (Lampung *Utara* and Northeastern Lampung *Tengah**)

In the regions recently opened to transmigration in Lampung (1975-1984), the farmers installed according to the RCFC model obtain poor yields. The rice production only covers part of their families' nutritional needs.

Rice is most often cultivated along with the maize and the cassava according to the traditional Javanese *tumpang sari* method (Tab. 19). Even taking into account the maize and cassava yields, the transmigrants barely cover their families' nutritional needs. They remain at the mercy of a poor harvest (Tab. 20 and 21).

* Central

Table 19 Agricultural calendar of *Tumpang Sari* system

Date	Duration from seeding	Farm activities
Sept/Oct	J − 45	Hoeing (1 month/ha), as soon as the rains begin
November	J − 0	Seeding rice and maize
	J + 7	Nitrogen fertilizer spread (125 kg urea/ha) and cassava planting
	J + 25	Weeding the crops, spreading potassium fertilizer (125 kg/ha)
January	J + 60	Weeding the crops and spreading phosphate/ nitrogen fertilizer (60 kg TSP & 60 kg urea ha)
February	J + 90	Harvesting early high-yielding maize varieties (Arjuna, potential: 50 qw/ha)
March	J + 105	Harvesting early high-yielding rice varieties (IR, potential: 80 qw/ha)
April	J + 118	Harvesting local maize varieties (Harapan baru, potential: 15 qw/ha)
May	J + 150	Harvesting local gourmet rice varieties (Gogo rice, potential: 10-15 qs/ha)
June	J + 240	Harvesting cassava, earlier or later according to families' nutritional or cash needs

Source: DOROSH, PERRY, 1984.

Table 20 Average paddy production per migrant family

Year of installation	Average Yield
1975-1979	550 Kg
1980-1982	824 Kg
1982-1984	746 Kg

Source: Transmigration Income Survey, BPS, 1985.

Table 21 Yields, sales and nutritional balance

Installation year	Yields (kg/ha) Paddy	Maize	Cassava	Paddy sales kg/year	Nutrition needs met
1975-1979	550	90	930	110	90%
1979-1984	790	250	750	200	115%

Source: Transmigration income survey, BPS, 1985.

The Case of the Irrigated Rice Farming Regions (Western Part of Lampung *Tengah* and Lampung *Selatan**)

The greatest limiting factor in terms of increasing the paddy yields is water. When the irrigation is very badly controlled (for example, in the 1970 irrigation projects), the yields come to 2.0 tons per hectare, barely covering the cultivation costs (input + outside labour) When the irrigation is better controlled, without using fertilizer, yields reach 3 to 3.5 tons, as in the Pringsewu region.

* South

When the water is no longer limited, the second greatest limiting factor is the use of fertilizers, which can increase the yields to 5 tons/ha. If the intensification is perfectly understood and mastered, as in the Trimurjo region, yields can be as high as the record 8 tons/ha (level obtained in 1986 at Untoro, *kecamatan* Trimurjo), which is the equivalent of the best Javanese and Balinese farmers - although there is still not enough water to ensure a third harvest per year.

Despite these exceptional yields per hectare, the yearly production level per farm remains low, from 3 to 10 tons/ha respectively at Seputih Raman and Trimurjo. There is a simple explanation: land is in great demand in the irrigated rice-farming areas of Lampung, as they have been settled for a long time. In 1980, the population density in the rural areas around Pringsewu was 780 inhab/km^2, nearly as much as in Central Java in the same period (868 inhab/km^2 in the Yogyakarta region). Many farmers own less than 35 *ares* of rice fields, which forces them to seek a complementary activity to be able to subsist. In extreme cases, these farmers are incapable of being able to set aside funds to intensify their production systems (Tab. 22).

Table 22 Technical level, production and marketing in five rice areas of Lampung

	Farm size (*ares*)	Irrigation Crops/year	Fertilizer (kg/crop/ha) *	Pesticide (l/crop/ha) **	Paddy yield Qw/crop/ha	Production (t/year)	Marketable part
Kec. Trimurjo *Desa* Untoro	66.9	Technical 2 crops/year	560	5.35	76.9	10.3	90%
Kec. Pringsewu *Desa* Fajaresok	33.4	Technical 2 crops/year	423	2.85	40.5	2.7	60%
Kec. Seuptih Raman *Desa* Ruktiharjo	83.2	Technical 1 crop/year	416	4.50	31.0	2.6	60%
Kec. Sidomulyo *Desa* Sidoharjo	96.8	Rainfed 1 crop/year	273	1.65	29.5	2.9	60%
Kec. Seputih Surabaya *Desa* Srikaton	60.0	Rainfed 1 crop/year	74	0.75	6.0	0.4	-60%

* Kg of urea, trisuperposphate and KCl

** litre of Diazinon equivalent

Source: LEVANG P., in Transmigration and spontaneous migrations. Lampung. ORSTOM/Transmigration Department, 1989.

Caught in the vicious circle of debt, they have no other resources except to sell all their rice yields after harvest, just when the price is at its lowest, in order to reimburse the loans they contracted during the year.

The variety of rice used most frequently is now IR. It has recently displaced *Cisadane*, a Sundanese variety. These two varieties have many advantages over traditional varieties, especially their high yields and their greater resistance to weather conditions. Unfortunately, their taste is quite mediocre, according to the very demanding standards of the local consumers.

The harvest is carried out by *gotong-royong* (mutual help) groups, or with agricultural labourers when the family labour force is insufficient. Payment is done in *bawon*, a percentage of the harvest given to the labourer.

There is little difference in price between the varieties: Rp 5/kg more for the Cisadane than for the IR. The official price reference is now the basic price rates fixed by the *BULOG* before each harvest (Tab. 23).

Table 23 Paddy purchasing prices by BULOG from KUD's (first harvest 1987)

	Dryed paddy (field) GKL	Dryed paddy (village) GKD	Dryed paddy (barn) BKS	Dryed paddy (hullable) GKG	Paddy BULOG BRS
Maximum authorized moisture	26%	19%	16%	14%	12%
foreign matters	10%	8%	6%	3%	0%
green grains	15%	10%	9%	5%	0%
broken grains	3%	3%	3%	3%	3%
coloured grains	3%	3%	3%	3%	3%
Price (Rp/kg)	115	145	165	190	313
Conversion factor *	1.88	1.72	1.61	1.47	1.00
Corrected price (Rp/kg)	216	249	266	279	313

* number of kg of paddy necessary to obtain 1 kg of paddy BULOG.
Sources: DOLOG Metro, July 1987.

Despite the introduction of these standards, the farmers' and merchants' price estimations are still linked to many "subjective" elements. The laws of supply and demand, or more simply the farmer-merchant relations, cause considerable variations in the price at each transaction.

Small-scale Collectors

This is an optimal step for the farmer in the marketing of his rice. He can sell it directly to the factory. But since he usually has little information on the prices and the market, he has to negotiate firmly to obtain the same conditions as the small-scale merchants he is "bypassing".

The small-scale collectors usually live in the rice-farming region and collect the rice for the factory in their village. However, sometimes commercial agents from other regions, where there is only one harvest per year, travel more than 200 km in August and September to Metro to buy paddy. They bring back the unhusked rice to their factories and make a profit on the wholesale activity.

The Merchant Farmer, Agent for the Local Factory

Quite frequently, for one reason or another (insufficient income, other commercial or seasonal activity), a farmer will collect his neighbours' rice production.

He therefore works for a "boss" who owns the drying and husking installations. This is a seasonal activity that is carried out in April and May, and sometimes in August and September, in the regions where there are two rice harvests per year. This

type of middleman often works with two or three members of his family, who share the tasks. One leaves by bicycle or motorcycle to find paddy in the neighbouring regions (10 to 20 km maximum). He visits the farmers, who usually sell him their paddy that has been dried at the village to 19% humidity. He does not pay a great deal of attention to the variety, because his boss will mix *IR* and *Cisadane* when the rice is dried before husking. When he has enough, he will borrow a truck and the money to pay the farmers for his boss.

All the costs (transport, coolies, drivers, etc.), are met by the boss. The commission retained is low, varying between Rp 2.5 and 5/kg of paddy collected. The small-scale collectors prefer to limit their risks as far as possible since they have little money; the value of a truckload of rice is one million Rupiah, which represents their yearly profit.

The Rice Merchant, Agent for a Large City Wholesaler

This merchant is most often the agent of a wholesaler who lives in a region where there is a large production shortage or a single rice harvest per year. During the first rice harvest, he trades in paddy and unhusked rice in his home region.

During the second rice harvest, he goes to the production zones (Metro) where he collects entire truckloads of paddy to bring back to a large factory in his home region.

This intermediary does not process the rice himself. As he does not own his transportation means, he delivers directly to his boss's shop or factory. Contrary to the small-scale local merchant, he handles all the costs (transportation, search for merchandise, renting a truck, etc.), using money he has borrowed from his boss beforehand (from 1 to 2 million rupiah).

The Rice Factories

These factories vary widely in capacity and levels of capital. Several decades, both in terms of economic and social organization separate the local factory run by the community and producing 80 tons of white rice per year, and the modern refinery whose output comes to 3,000 tons per year.

The Local Factory, Result of the Village Headman's Active *Gotong Royong* Policy

The *LKMD* (*Lembaga Ketahanan Masyarakat Desa*, a sort of "town council" which sets up the system of security and public works at the village level) decides on the construction of small rice husking factories in each village. If the village has insufficient money, the system is a simple one: all must participate in the common task according to each person's possibilites. The wealthiest provide the money and materials, while the poorer provide the manpower.

In this manner, in Adipuro (*kecamatan* Trimurjo, near Metro), for three years the wives collected one spoonful of white rice per day of the family ration, to wit, 30 grams per family per week, which came to almost 1,500 kg of rice at the end of 1983.

The *gotong-royong* sessions for building the temporary shelter destined for the machine took place every wednesday morning from 8:00 to 10:30. Each person donated Rp 500 either in money or in materials. After three years, the building was finished and the money needed to buy the motor had been collected. The yearly capacity and

level of use are usually low, less than 3 tons of white rice per day for 350 hours of annual use.

The *bawon*, or payment in kind by the farmer for the husking operation is fixed at one part per fifteen refined. This is more advantageous for the farmer than the *bawon* asked by the private rice factories, which averages one - tenth or one-twelfth.

The Private Rice Factories

These handle the majority of the paddy produced in Lampung. Though they refine considerable quantities, their management remains a family affair. The daily capacity is between 5 and 20 tons of white rice, with a yearly capacity of 300 to 1,500 tons for four months of intensive use (Tab. 24).

Table 24 Processing costs of two Lampung rice factories

	Factory in *Kec.* Kalianda (Lampung *Selatan*) Production: 300 t/year Capacity: 2.7 t/day		Factory in *Kec.* Trimurjo (Lampung *Tengah*) Production: 1050 t/year Dapacity: 15 t/day	
	Total Rp	Rp/kg white rice produced	Total Rp	Rp/kg white rice produced
Variable Costs	2,133,000	6.11	14,245,500	13.57
Fuel	900,000	3.00	3,150,000	3.00
Bagging	108,000	0.36	378,000	0.36
Transport	1,125,000	3.75	3,000,000	2.86
Coolies for drying	0	0.00	7,717,500	7.35
Fixed Costs	4,208,400	14.03	11,226,000	10.69
Factory workers	2,250,000	7.50	3,000,000	2.86
Upkeeping	638,400	2.13	2,226,000	2.12
Amortization	1,320,000	4.40	6,000,000	5.71
Total Costs	6,341,400	21.14	25,471,500	24.26
Incomes (*bawon*) (10%) of paddy)	9,390,000	31.30	328,650,000	31.30
Profit	3,048,600	10.16	7,393,500	7.04

Source: ORSTOM surveys, 1987.

The rice brought in by the farmers or the commercial agents is still too humid to be husked immediately. The final drying to 14% humidity lasts two full days and is always carried out on the factory's cement drying floor. The different operations (emptying, controlling the drying, filling, and handling) are carried out by day labourers who receive Rp 5 per kilogram of paddy ready to husk. The technical personnel (1 worker for 250 tons of husked rice per year) earn a monthly salary of from Rp 30,000 to 50,000.

When the farmers bring their rice directly to the factory, they pay a *bawon* of one-tenth, as opposed to one-fifteenth for the factory's agents. This gross margin

corresponds to the profit of the small-scale collector, to wit, about Rp 5/kg of collected paddy.

Once the rice has been processed (see Fig. 10), its storage requires several means that are beyond the farmers' and the village factories' possibilities (dry hangar, fumigations, constant supervision). These roles all to the wholesalers and the government.

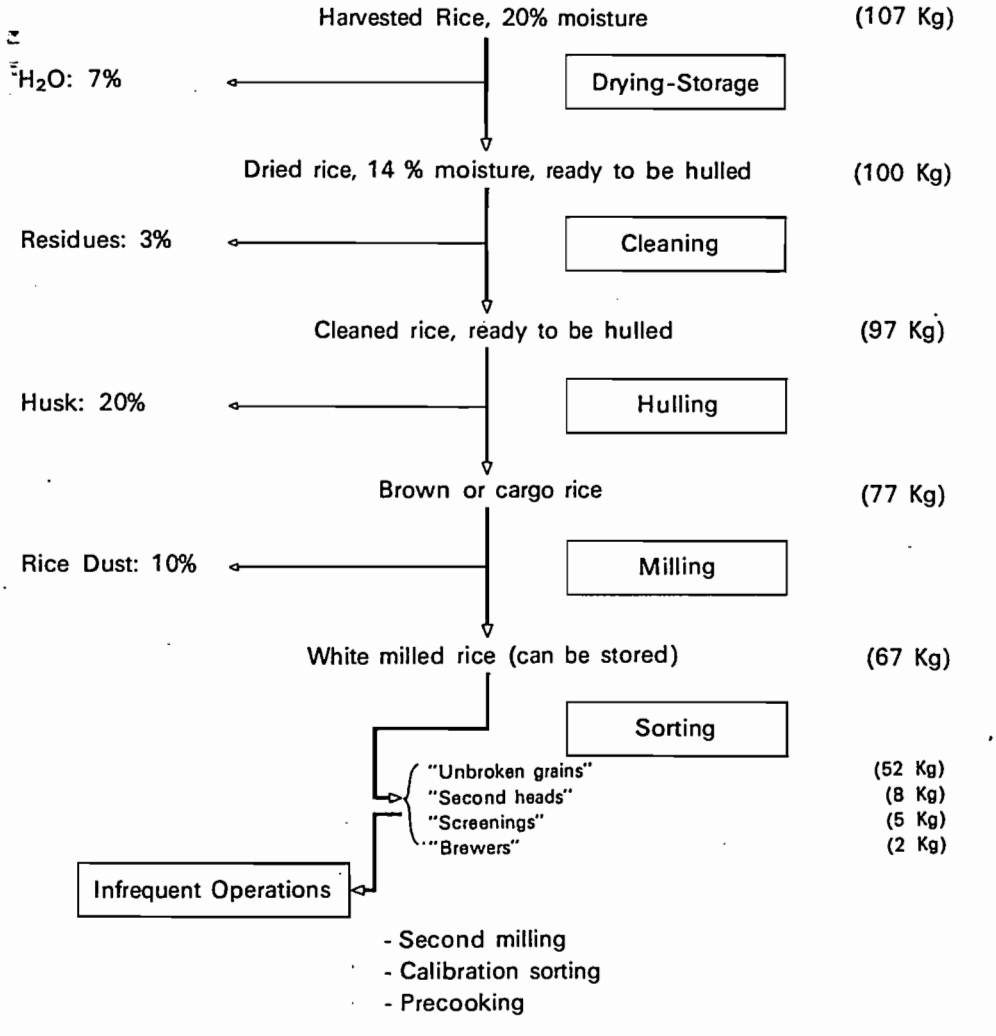

Figure 10 Rice Processing
Source: ORSTOM surveys, 1987.

The collecting area of the smallest factories is limited to the village. Part of the production is redistributed on the spot, but the majority of the processed rice is shipped to the nearest towns, as in the case of a factory in the Metro area which sells nearly 80% of its product to the Metro itself.

The Very Large Rice Factories: Using Modern Techniques

The very low level of production in Lampung does not allow for the extension of such factories. Their optimal processing capacity (25 to 40 tons of paddy per hour) is only used during the harvest periods. At other times the low supply leads them to shut down all their activities (Tab. 24)

The owner, usually Chinese, finances an entire network of 20 to 30 *anak buah*, his small-scale merchant collectors. He owns artificial drying installations that are 20 times more rapid than the traditional sun-drying method. Working closely with his other wholesaling colleagues, he stores the paddy and the white rice and participates in the supplying of the rice markets in Lampung and other provinces.

The Chinese Wholesaler

This merchant lives in the large cities (Tanjung Karang, Teluk Betung, Kotabumi, Metro, Pringsewu) and supplies the capital needed for the commercial activities of all his collecting agents. He distributes the production received in the grocery shops of his own town and has contacts with the wholesalers in other regions where supplies are lacking.

Up to 5,000 tons of white rice are handled every year. During the chronic rice shortage of the 1970's, the *BULOG* had close contacts with the wholesalers: in the case of importations, the latter provided a particularly efficient rice distribution channel towards the farther-removed consumer areas.

Since then, the commercialization conditions have changed a great deal. Indonesia no longer officially imports rice, though in 1985, while the wholesale price on the Jakarta rice market was greater than the world price, imports unregistered by the Indonesian statistical services took place between Indonesia and Thailand (rice delivered CIF Bangkok to Jakarta). Moreover, the government set up a policy that sought to favour the co-operative sector rather than the private one.

The wholesalers' role remains an important one, though they are no longer needed in the distribution of imported rice. The wholesaler acts in a financial capacity, and has the obligation to stock the rice collected in order to distribute it regularly during the year. This is actually an advantage, because the buying price is at its lowest at harvest and increases steadily up to the period just before the main harvest of the following year, which compensates for the storage costs (spoilage, financial costs).

Furthermore, the wholesale merchant has an interprovincial information and connection network that allows him to intervene immediately in markets which are occasionally quite far-removed. Thus, in *NTT* (*Nusa Tenggara Timur:* the eastern Indonesian islands), *BULOG* forecasted a 6,000-ton rice deficit for 1986; this quantity was stored in its hangars in Kupang, the provincial capitol. But the expected shortage did not cause a price jump because 6 wholesalers in South Sulawesi, 1200 km from Kupang, provided the province with a similar supply during the same period.

But relations with *BULOG* are not totally broken off. Thus at the end of the season, the latter controls the rate of increase in the consumer price by providing rice at regular intervals throughout the distribution, including the wholesalers.

The Local Grocer

Villager or city-dweller, this merchant provides the consumers in his area with a variety of rice of different origins and qualities. His village clients, when they can afford it, seek quality, and prefer the more appetizing Sundanese rice to Lampung rice, paying up to Rp 40 more per kilogram. The price difference between the zones of production and consumption is quite varied:

- in the mountainous coffee regions it can reach Rp 300 kg. Rp 200 of which is reserved solely for the costs of transportion by motorcycle or porters. This brings the average 1987 price from Rp 280 kg on the farm to Rp 560 kg in the isolated mountain villages. Converted into US$, the price per kilo of Metro rice is $ 0.36 kg in the highest mountain villages, compared to $ 1.00 kg for the least expensive rice in the supermarkets.

The Public Market

A Very Simple Official Organization

Though it is theoretically simpler, rice commercialization on the public market is a particularly structured and codified organization. The normal procedures are as follow:

- The *KUD* (*Koperasi Unit Desa*, or village co-operatives) collect the rice paddy from their members and the farmers in their collecting zones;
- They then process it into white rice and transport it to the *DOLOG* hangars (a local *BULOG* agency, interministerial organism for intervention on the food products market: rice, sugar, maize, soybean); and
- *DOLOG* reimburses the co-operatives' shipping costs according to an inclusive price established per kg of collected paddy, and stocks the rice for the numerous functions is must carry out.

Functions and Responsibilities of the Central Agency *BULOG*

BULOG's main function is to intervene on the rice market in order to maintain producer and consumer prices at an acceptable level for all, through the storage of part of the harvest. The storage policy has several objectives:

1. To provide emergency reserves in case of food shortage in certain Indonesian regions (*Nusa Tenggara Timur* and *Barat**) during the numerous natural catastrophes (drought, floods, earthquakes, and volcanic eruptions).

When the shortage is too great, *BULOG* has the authorization and the monopoly for importations of rice and their distribution via a system of supply co-operatives that regroup small-scale city grocers, or via the wholesalers acting on the inter-provincial market.

2. To intervene in the buying and selling prices in the province itself or in other Indonesian regions in order to carry out the integration of the food products markets at the national level, and to participate in the Indonesian socio-political balance (Fig. 11).

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* West

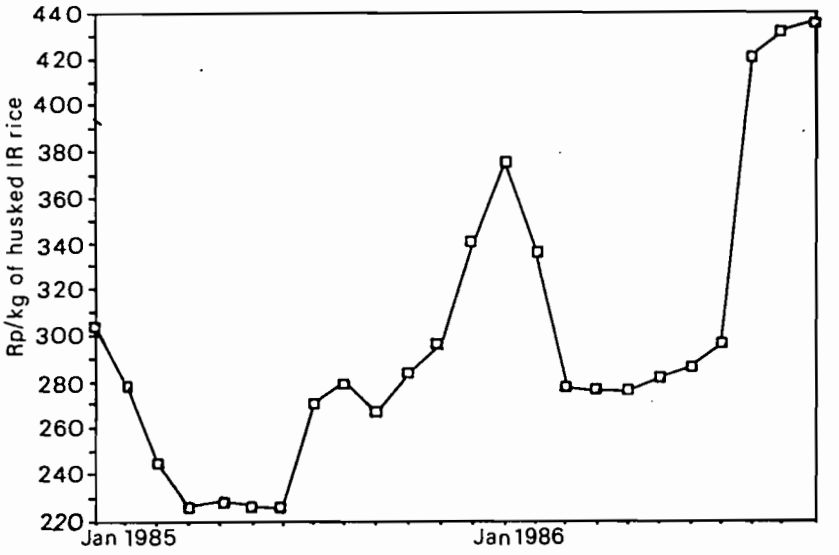

Figure 11 The Price of Rice on Metro's Market During 1985 and 1986.
Source: ORSTOM field surveys. 1987.

Each year, *BULOG* sets a price for the producer. At the start of the 1987 season, this was fixed at Rp 313 and 307/kg of white rice respectively for the *KUD* and the non-*KUD* (private merchants). During the harvest, when the prices drop, this bottom price is destined to ensure the rice farmer's income. When this system does not suffice, or when *BULOG* cannot provide sufficient stock, it can buy paddy directly from the farmer through locally recruited "task forces".

The rice retail policy is designed to protect the consumer from excessive price increases. Thus, at the end of the season, *BULOG* tests the market by making repeated sales offers for rice from its yearly stocks to the supply co-operatives or to wholesalers, at a "goal" price. On October 20, 1987, this price was set at Rp 400/kg. It is not usually exceeded by the market price until the very end of the season, in December and January (Fig. 12).

3. Regularly supply the portion of the salary paid in kind to the Indonesian civil servants. This can be considerable: a salaried engineer in the Ministry of Transmigration receives Rp 80,000/month in cash and Rp 40,000/month in kind. The *DOLOG* retail price for budgetary buying groups (Ministries, Armed Forces, large national enterprises) was fixed at Rp 418/kg for 1987.

The information necessary for the realization of this policy of intervention is gathered in the field by the regional and district agencies. Thus the registered producer and consumer prices and the estimated stocks retained by the farmers, allow *BULOG* to launch and co-ordinate its interventions.

The last activity carried out by *BULOG* is that of providing aid for development formation, and information in the co-operative sector. By buying different types of rice at fixed prices, of rice whose quality is defined according to precise standards (Tab. 23), *BULOG* helps introduce specific rules for all the commercial transactions in the

sector. Moreover, it provides basic formation for the *KUD* and favours commercialization via the *KUD* through financial aid for shipping. This brings to Rp 15/kg (5% of the total price), the advantage given to the *KUD* with respect to the private markets in terms of supplying *DOLOG*.

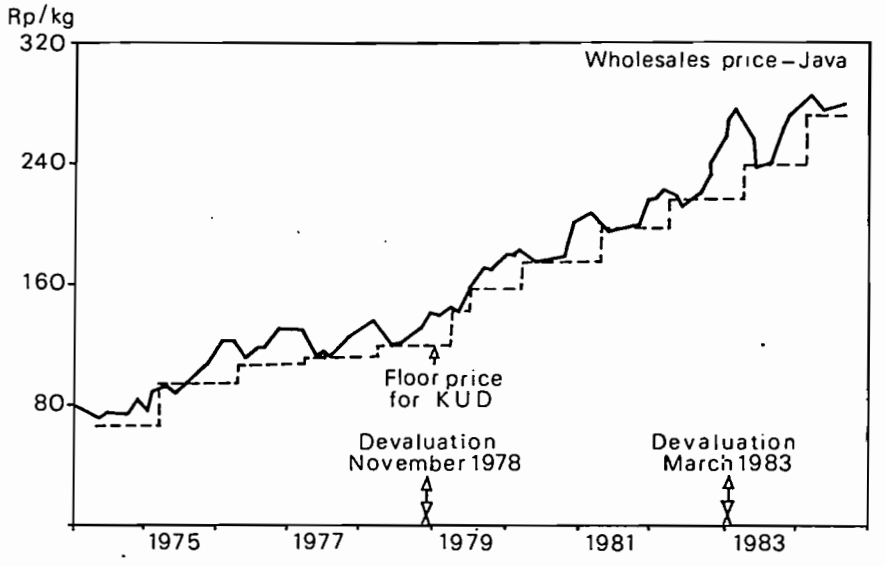

Figure 12 The Wholesales Price of Rice in Java From 1974 to 1984
Source: Dorosh Perry 1984

The Constraints in the Operation of the Public Market

In reality, behind these objectives, the realizations and practices of *BULOG* differ from those of the *KUD*. This emphasizes the numerous problems related to the commercialization of the agricultural products and its control by the local authorities.

The *KUD* Lack Financial Means

Lampung *Tengah* and Lampung *Selatan* areas

The *KUD's* main problem is its lack of financial resources:

- to invest in production means. The *KUD* rarely have a husking machine of sufficient capacity to process all the rice collected. They subcontract this part of their operations, with the accompanying losses this implies;
- to buy rice from the farmer. The *BRI* (*Bank Rakyat Indonesia*, or People's Bank of Indonesia), equivalent of the French Credit Agricole, provides funds for collecting in the form of an overdraft authorization. The latter, multilaterally "negotiated" according to a delivery contract for *DOLOG*, often arrives quite late; and
- to make loans to needy farmers at acceptable rates. Loans are frequent on the private market, though the interest rates are still high.

This lack of financial resources can be partially explained by the fact that outside financing possibilities are infrequent and often poorly distributed. For example, in the Metro region, a *KUD* benefitted in 1983 from a grant for the construction of a 1000-ton capacity hangar (value 150 million Rupiah). In 1987, the hangar had just been finished, but the *KUD* had already been bankrupt for two years.

Furthermore, the internal financing capabilities of the co-operative's members themselves are very limited. The company capital provided by the farmers upon entry comes to Rp 3,000 to 5.000 and the yearly rate is to Rp 1,500 for each member. Tables 25 and 26 show the yearly trading accounts and the balance sheet for a *KUD* in the metro region. It will be noted that the company capital provided by 1,077 members as of December 31, 1985 amounted to Rp 2,500 per person - to wit, $ 1.50/farmer.

Table 25 Earnings of a *KUD* in Trimurjo, 1985

	Rupiah	US$ *
Rice sales	295.930.000	263.050
Service incomes	6.875.000	6,110
Total incomes	302.805.000	269,160
Rice purchases	281.000,000	249,780
Operating costs	16.365.000	14,550
Exceptional costs	515,000	460
Total costs	297,880,000	264,780
1985 Profit	4,925,000	4,380

* 1985 average exchange rate Rp 1125/US$

Source: Orstom surveys, 1987.

Table 26 Balance sheet of the *KUD* at Trimujo, 1985

	Rupiah	US$ *
Fixed assets	105,000,000	9,330
Stocks	22,000,000	1,960
Assets (< 1 years)	1,250,000,000	111,110
Incl. credit KUT ** granted to farmers	(91,000,000)	(80,890)
Total assets	1,377,000,000	122,400
Capital	150,000,000	316,130
(incl. farmers' shares)	(2,700,000)	(2,400)
1985 profit	4,900,000	4,360
Long term liabilities	7,300,000	6,490
Liabilities (< 1 year)	110,500,000	98,220
(incl. credit KUT not yet distributed)	(8,400,000)	(74,670)
Total liabilities	137,700,000	122,400

* 1985 average exchange rate Rp 1125/US$

** KUT = *Kredit Usaha Tani*, credit package granted to *KUD* members and due after the harvest.

Source: Orstom surveys, 1987.

The third problem comes from *BULOG* itself, which "chooses" its suppliers. This partially explains the irregularity in the supplies sent from the *KUD* to *DOLOG*, and the structural impossibility they face in really productive investments over more than one year (Tab. 27).

Table 27 Supplies from 3 KUD to the DOLOG of Metro

(Tons of white rice/year)	1984	1985	1986
KUD Brajaharjosari (Kec. Way Jepara)	0	1,500	3,500
KUD Waymili (Kec. Labuhan Maringgai)	4,500	100	0
KUD Adipuro (Kec. Trimurjo)	0	1,000	200

Source: Orstom field surveys, 1987.

The reasons behind this choice are simple: ensure the quality of the supplies, which are to be stocked for several years.

Thus *DOLOG* refuses many loads because of low quality. When the rice delivered is of poor quality and is perishable, *DOLOG* requires that the rice be re-processed (glazing). However, *DOLOG's* method of quality control is still delicate, and some economic agents have noted that simply changing the truckload and re-presenting it was sufficient to obtain acceptance.

The Transmigration Zones

The role of *BULOG* or the regional *DOLOG* agencies is not very developed in regions that are usually isolated. The majority of the rice trade is carried out by the private sector, which ensures the transport of the rice in paddy form to the consumer areas, often located at some distance. The specific constraints associated with the commercialization of the transmigrants' rice compound the difficulties already mentioned. Furthermore, auto-consumption remains high. In the best of cases, the farmers can market 100 to 200 kg of paddy for a farm production of about 650 kg. These limited quantities vary from one year to the next. And few *KUDs* can operate regularly in the Transmigration centres, while MOT financial aid for the farmers diminishes considerably at the end of the installation period.

Shipping remains the major limiting factor. Long distances, aleatory delays, and hazardous conditions lead to increases in production costs and reduced prices for the farmers' paddy. The transportation difficulties add to the lack of government aid in terms of marketing and disadvantages the transmigrants.

BULOG's intervention is done in regions where the infrastructure is well-developed. It does not seem suitable to the transmigration sites. The first step to be considered as a priority, should be that of consolidating and maintaining infrastructures. Other solutions for direct marketing aid can then be set up with more profit for both transmigrants and authorities. These should take into account the particular constraints relative to production and commercialization in these disadvantaged regions.

The Civil Servants' Dissatisfaction with the *BULOG's* Supplies

According to many of the civil servants surveyed, the rice supplied by the *BULOG* is often extremely unappetizing, because it is stocked too long (usually 1 to 2 years for the quantities reserved for budgetary groups). Therefore, they most often demand the possibility of buying better-quality rice, which could be done in two ways:

- either upon receiving their *BULOG* rice from their local grocer and exchanging it for another type, for which they pay the difference (as of October 20, 1987, *BULOG* rice was priced at Rp 350/kg as opposed to Rp 250/kg for high-quality rice);

- or by buying their rice directly from the subcontracting company which ships the rice for *BULOG* from its regional hangars to those reserved for the budgetary groups. The October 20, 1987 price is in this case only Rp 225/kg, and the rice does not go to the civil servant for whom it is destined.

Conclusion

Despite these negative aspects, the objective of the government's organization of the rice sector has been met since production has doubled over the last 10 years. The "green revolution" affected the entire country. The *KUD* play their role of relay-stations in the development of rice farming and its financing. The advent of price and quality standards, through *BULOG's* actions, has begun to change the habits of this sector.

In terms of prices, *BULOG* has succeeded for 15 years, without monopolistic interventions, in preserving a stable relationship between the price paid to the farmer and the price asked of the consumer. Despite the short-term problems mentioned, the long-term policy of the government and *BULOG* in the social (preservation of the national balance) and alimentary domains, have succeeded.

But, as there are changes occuring in the Ministries (March 1988), and Indonesia is preparing to enter *REPELITA V*, it would seem necessary to redifine *BULOG's* objectives. Created during the difficult period of the 1950's, its primary function was to ensure steady rice supply to the civil servants and the army, who were the key to national security. Today, this function no longer has its purpose since most of the civil servants resell the portion of their salary paid in kind. Thus *BULOG* buys white rice from the *KUD* at Rp 313/kg and sells it to the civil servants at Rp 418 kg, who in turn resell it at Rp 225/kg, that is to say less than the Rp 225 paid to the producer. It would be more efficient economically to provide this alimentary allocation as part of the monetary salary itself.

Principal Problems in the Production and the Commercialization of Rice

Production

Rice is the main farm crop in Lampung in terms of surface areas cultivated (390,000 ha: of which 160,000 are irrigated from a total area of 3,300,000 ha). There are two opposing systems of rice production in Lampung, intensive cultivation and extensive cultivation, the choice of which depends primarily on the farmer's environment (Tab. 28).

Table 28 Environment and rice farming

	Lampung *Selatan* Lampung *Tengah*	Lampung *Utara*
Infrastructure	developed	underdeveloped
Farmers' isolation	not marked	severe
Demographic pressure	high	limited
Pedo-climatic conditions	fair	fair
Type of agriculture	commercial	food crops
Type of commerce	regular	occasional
Rice farming	irrigated intensive	rainfed extensive

Source: ORSTOM field surveys, 1987.

The farmer can market his rice in two ways, via the public sector (*BULOG* buys 100,1000 t year in Lampung) or via the private sector.

Pedo-climatologic Conditions

The majority of the ricefields are situated in the central part of the province. The soil is not very fertile, but the combination of well-controlled irrigation and an adequate level of fertilization, compensate for this handicap. In the regions where irrigation cannot be done, rice farming is poorly adapted and yields are low.

The climate is humid (2,000 to 3,000 mm/year), which does not favour drying operations and rice transportation. The dry season (< 100 mm of rainfall per month) lasts from May-June to September-October and makes a second yearly crop of rice aleatory in the non-irrigated zones.

Infrastructures

Since the last oil crisis in December 1985, the rate of construction of the large-scale irrigation projects has slowed considerably. The development perspectives for the networks remain unencouraging, especially as their profitability diminishes as increasingly more marginal zones are placed under crop.

The road network as a whole is developed in the *kabupaten* of Lampung *Tengah* and Lampung *Selatan* and the major towns have ample connections. Travel time remains limited (45 km h on the national roads and 25 km/h on the dirt roads leading to the villages). In the southern part of the province, these trails are from 5 to 10 km long, whereas one must cover 60 to 100 km of dirt roads to get to the transmigration sites in the northern part of Lampung *Utara*.

Technical Level, Formation

The rice sector, due in part to the *BIMAS* programme has undergone considerable growth since 1977. The farmers' technical level has increased in Pringsewu and especially in the Metro region, as shown by the yields of 4.5 to 8 t of paddy per hectare obtained today. However, this favourable situation must not overshadow the group of small-scale rice farmers, for whom the intensive use of fertilizers or phyto-sanitary products is not profitable, as the water supply, a primary factor for yields, is limited.

Financing

The government's financial contribution to rice farming is a large one. The credits attributed in the form of production means, distributed and managed by the *KUD*; the investments are made in infrastructures (roads and irrigation networks), and the maintenance of the price of fertilizer (on Oct. 1, 1987, one kilo of fertilizer cost Rp 145, for a production cost of Rp 300/kg). This approach has enabled rice production to double in ten years.

Commercialization

Transport

Shipping is most often organized by private shipping companies. The merchants rent trucks for a specified destination either for a fixed price or per kg of goods transported. When the region has proper roads and is densely populated, market laws favour demand and the shipping costs remain relatively low (from 0.1 to 0.15 per km covered and per kg transported). On the other hand, in the isolated regions, transport becomes long, costly, and hazardous, especially during the rainy season (tab. 29).

Table 29 Average transport cost to the provincial capital

Origin	Distance Km	Freight cost Rp/kg
Pringsewu	45	5
Kecamatan Pringsewu	55	8
Metro	50	5
Kecamatan Metro	60	8
Wonosobo	105	15
Kotabumi	110	15
Banjit	180	25
Menggala	125	18
Wiralaga	230	40
Krui	270	35

Source: ORSTOM field surveys, 1987.

Processing

Pre-drying before stocking the paddy on the farm, is a determining factor for the future quality of the rice. The farmer frequently cannot carry out this operation correctly. He dries the paddy on mats laid directly on the ground, as he does not have a cement drying floor. Since the rains are still heavy at this time, drying is often delayed for several days and the paddy is stored fresh. The quality of the rice is irreversibly diminished, the grains turn yellow, and the taste and resistance during storage are lessened.

Moreover, the necessity of constant supervision during the final drying makes this operation difficult to carry out on the farm. Thus the rice factory always handles this operation on its cement drying floor, with a permanent supervision staff.

If the traditional methods of husking are still done in the isolated regions, where the quantities of rice produced remain limited, the large rice-farming regions are over-

equipped with rice factories. Husking the *IR* varieties is apparently problematic in Lampung, because the grains break easily and the quality of the final product is lowered.

Storage

The paddy poses no particular problem for the farmers and the small-scale merchants. The only requirement is a well-aired, dry storage area, since the envelope protects the grains from pests.

Storing white rice is more delicate and requires means that are not within the smaller companies' financial possibilities (dry hangar, constant supervision, fumigations and periodic airing). This is handled by the *BULOG* and the wholesalers who, given the present price levels, can make a profit on the operation. The high costs (protecting the rice, renting the hangar, and interest on the borrowed sums) and the losses in rice, explain most of the price differences between the first harvest and the last of the year.

Quality of the Rice

There are two main qualities of rice:

- the high-yield irrigated rice types (*IR, Cisadane*), whose taste is average to good and whose cost per kg is low; and
- the rainfed varieties (gogo paddy), high in price per kg and excellent in taste.

The primary variety planted in Lampung today is *IR*, which has a high percentage of broken grains (less than 14^{th} of the normal length). Storting the rice is rarely done and even then only for the quality supplies. The *BULOG's* introduction of standards of quality for paddy and rice does not prevent the merchants from ignoring them during the early steps of the commercial chain. The percentage of humidity, and broken or coloured grains are still evaluated on sight during the transactions and the lack of openess favours the merchants rather than the farmers.

Information

Within the sector, the farmers doubtless have the least market information at their disposal. More generally, during a commercial transaction, the largest intermediary is favoured. The *BULOG* standards of quality are not respected, and the sale is reduced to a sort of power struggle which disadvantages the less-influential party, especially if the quantities at stake are low with respect to the more important merchants. The *KUD* do not meet their obligations as principal source of information for the farmer, as, despite the advantages offered the *BULOG*, they do not respect the standards. The *KUD's* management remains a serious problem, because the directors are not trained.

In the populated rice-farming regions, the farmers have at least one source of reliable information which serves as a basis on which to bargain the price of rice on the local market. But in the isolated or disadvantaged regions, the producers have no resource to an active local market.

Financing

For several years, the Indonesian administration has encouraged the growth of the co-operative sector. To production subventions, is added a commercialization which gives a theoretical advantage of Rp 15/kg to rice collected by the *KUD* for *BULOG*. Unfortunately, this advance has diminished considerably for many reasons: insufficient finances even at the creation of the *KUD*, prevent them from obtaining equipment, such as a drying floor. husking machine, storage hangar; delays in their overdraft authorizations that would allow them to pay the farmers in cash; monetary aid that is sometimes poorly-distributed or that arrives late; supply contracts from *BULOG* which vary from one year to the next and prevent the *KUD* from following a steady investment scheme.

Financing the private sector is done mainly by the private sector itself, even if in the well-developed regions of the province, the *BRI* has opened many village agencies. If the very large enterprises can go to the private banks for their financial needs (investment, financial credit etc,), the same is not true of the small businessmen with no financial assets, who must therefore work with a boss. The resulting system of digressive credit is fragile and functions through the mutual confidence of all parties concerned.

The Economy of the Sector

Prices

Even though the price of rice is still subject to wide seasonal variations, for the past 15 years the Indonesian government has succeeded in maintaining the relationship between the consumer price and the farm price. Much of the seasonal variation in price is due to the cost of storing the rice, as shown in Table 30.

Table 30 Wholesalers' storage fees for white rice

Price (Rp/kg)	1985	1986
April	223	275
December	-	432
February	373	-
Storage time (months)	10	8
Storage costs	40	47
Credit fees (2.7%/month)	68	65
Profit	42	55
% total monthly increase	1.75	1.90

Source: ORSTOM field surveys. 1987.

But storage usually remains a well-paid investment. provided there is no devaluation as there was in September 1986 (the profit on investing in rice storage fell to 2.7% per month in USS).

There is no system of pricing by quality, in spite of the *BULOG* standards of quality for transactions in paddy. However, dealers who make a great deal of large transactions tend to determine precisely the quality of what they buy. The percentage of humidity is determined by testers. and sorting through a sample of rice allows one

to obtain the percentage of broken or coloured grains.

For the farmer, the efficiency of the sector depends first of all on how isolated he is. The lack of roads and of husking machines obliges many farmers to sell their rice as paddy, which increases the transport costs per kilo of white rice. Thus their part in the final consumer price does not exceed 57%.

In the better-developed regions (Lampung *Tengah*), the farmer is in a better situation. But, though he can choose between selling his rice to the *KUD* or on the private market (no difference in sales prices), he is often obliged to opt for the latter where he is paid in cash. Moreover, the advantage that the farmer would theoretically obtain from the *KUD* is countered by the fact that this method of commercialization is less economically efficient (see Tables 50 to 52, pages 82 to 84).

In the regions around the towns, the farmer finds his best options, and can carry out the maximum of the operations himself in the hopes of a good profit. By stocking his paddy before hand, subcontracting the husking and reselling the white rice himself in the town's market places, his part can be as high as 71% of the consumer price (see Table 53, page 85).

The farmer obtains maximum efficiency when he handles the maximum number of operations himself, thus *KUD's* were set up to enhance this efficiency. Unfortunately, the *KUD* -type structure appears to be poorly adapted to transfer such savings to the farmers in terms of high on-the-farm prices. Eventhough *BULOG* offers positive advantages in terms of technical formation, commercialization via the public sector is unfavourable to the farmer.

Development of the Sector

Two complementary approaches can be suggested for this "two-speed" rice farming:

Any aid proposed for intensive rice cultivation should be concentrated on consolidating the results obtained at the production level and in commercialization. A price system destined to encourage quality can be set up provided the size of the *KUDs* (presently from 500 to 2,000 members) are reduced, and they are allowed to supply the private market. As one result, the farmers, who are not very informed in terms of administrating large societies, would have fewer management problems. Furthermore, the contacts with the market would bring about a greater efficiency of these structures, and thus increase the farmers' incomes.

The prospects of international rice prices over the next 10 years remain unencouraging for the farmers. Thus it would be risky to orient development in the isolated zones towards food crops only, especially towards rice. But intensifying the crop, as well as improving the rice trade in these yet-underdeveloped zones in order to ensure food self-sufficiency and to increase the farmers' incomes.

The reorientation of BULOG's objectives (decreasing the supplies for the budgetary groups at the part of the salary paid in kind) appears inevitable in the not-too-distant future, with the risk of seeing part of its personnel reassigned to other administrative functions. Many of these civil servants have an understanding of rice commercialization that must not be lost, and they could be reoriented to new objectives. A fraction of *BULOG's* budget could be reallocated to the development of rice cultivation in those regions where rainfed rice is grown, especially in the

transmigration areas. But, as in the developed rice-farming regions, the conditions of production and commercialization are not suited to the present organization carried out between the *KUDs* and *DOLOGs* in the most developed regions. Certain aspects will have to be adapted to the situation.

Aid for rainfed rice should first of all be centred on increasing production in the disadvantaged zones. Improving the infrastructures, studying the selection of the local varieties (increasing yields and quality), and perfecting specific production systems, are the priorities for such a policy. Commercial aid via small groups of farmers (base groups of 20 to 25 persons), through credits for the small investments needed for proper processing of the paddy (drying floors, husking machines, storage hangars, humidity gauges and scales in sufficient quantities) and contracts with the private enterprises (for shipping, for collective buying of production material), should lead to sales on the private market through supply contracts established with rice wholesalers who specialize in the gourmet varieties of rainfed rice.

3

Cassava Marketing in Lampung

The Typical Crop of the Marginal Zones

The Production Level

Reserved for the poorest soils, cassava is rarely cultivated alone in Lampung. It would take up an entire plot for much too long, since its cycle lasts from 8 to 10 months from planting to harvest. This is why is it associated with other food crops, upland rice and maize, in a traditional Javanese system of cultivation called *tumpang sari*. It is also occasionally associated with vegetables.

Because of these associations, the precise conditions of cassava production are difficult to grasp. However, the generalities of the crop as it is grown in Lampung can nevertheless be distinguished (see Tables 31 and 32).

Table 31 Return and profit of cassava cropping models at transmigration sites

	Extensive model assoc. with rice and maize	Intensive model *pekarangan*	Intensive model 50 *ares* cassava
Yield	6	12	15
Area planted (areas)	25	5	50
Production (ton)	1.50	0.6	7.5
Self-consumption (1)	0.35	0.35	0.35
Marketable surplus (ton)	1.15	0.25	7.15
Income from sales Rp (2)	40,250	8,750	250,250
Total costs Rp (3)	52,325	12,290	137,900
Wages (4)	32,000	8,000	80,000
Fertilizers	6,375	1,500	30,000
Financial costs	6,250	1,250	12,500
Land amortization	7,700	1,540	15,400
Return on investment (2) − (3)	-12,075	-3,540	112,350
Profit (2) + (4) − (3) Rp/workday	996	892	2,847
Total profit (2) + (4) + (1) − (3) Rp/workday	1,609	3,342	4,092

Source: ORSTOM field surveys, 1987.

Table 32 Model data for Table 31

	Extensive model assoc. with rice and maize	Intensive model *pekarangan*	Intensive model 50 *ares* cassava
Price of cassava (Rp/kg)	35	35	35
Working days/ha/year	80	100	100
Daily wages (Rp)	1,600	1,600	1,600
Fertilizers (Rp/kg)	150	150	150
Fertilizer spread (kg/ha)	170	200	400
Financial costs (Rp/ha)	25,000	25,000	25,000
Purchasing cost of land (Rp/ha)	616,000	616,000	616,000
Land amortization (years)	20	20	20

Source: ORSTOM field surveys, 1987.

Cassava is most frequently associated with another crop on a large field (50 to 100 *ares*). Yields are thus from 1 to 2 tons of fresh tubers per hectare under the *tumpang sari* system, which corresponds to a yield in cassava alone of 4 to 8 tons per hectare. The amount of fertilizer used is limited, and the varieties planted are not very productive. In the transmigration centres where the soils are particularly poor (very acid pH of about 4.0 - 5.0, soils leached of their mineral nutrients and often sandy, large quantities of exchangeable aluminum), when the limited organic reserves have been drained by two years of rice or maize crops, only cassava can develop and allow the families to subsist. In such extreme conditions, the type of farming carried out is altogether oriented towards subsistence and the income from marketing the surplus cassava is low.

In the gardens around the house (*pekarangan*), the yields can easily be doubled, even with the less productive local varieties. Fertilization is ensured by the kitchen scraps. The surfaces planted are small (5 to 20 *ares*). In the *pekarangan* one finds many species of plants: numerous fruits are planted such as rambutan, papaya, mangoes, coffee, cocoa, as well as annual crops like maize, soybean, and vegetables.

The intensive type of cassava cultivation in the *pekarangan* is more profitable both economically and nutritionally than the agricultural model on which the installation is based (RCFC), associating rice, maize and cassava. The farmer's financial risk (initial investment in production methods) is lower and the yearly labour required for cassava can be met in the equivalent of only 5 workdays per year.

However, in the perspective of developing the cultivation of cassava in the transmigration centres, the third model presented in Tables 31 and 32 (column "intensive cassava, cultivated alone on 0.5 ha") allows for a high return on the initial investment, even allowing for a low price for fresh cassava over the next 5 to 10 years (US$ 21 per ton).

Finally, the controlled development of cassava farming in the host regions for transmigration meets several of the farmer's objectives:

- it allows the transmigrants to ensure food self-sufficiency because it grows better in the difficult agroclimatic conditions of the marginal zones than other food crops; and
- there are possibilities of exporting the surplus cassava. The GATT agreements regulating the supplying of the EEC by the major producing countries, provide for an

annual quota for Indonesia which has never been met.

Whereas the cassava harvest on small surfaces is done piecemeal according to the family's needs, on larger surfaces it is usually entrusted to the *penimbang hasil bumi*, or literally the "harvest weigher", or harvest contractor. At harvest, which takes place in August-September in Lampung, cassava is the only plant still in the field

The *Penimbang Hasil Bumi*, or Contract Harvester

Paradoxically, this man works most when the price of cassava is lowest, which lowers the farmer's income even more. Since the profitability of pulling up the cassava is negligible, the farmer decides to look for other sources of income rather than harvest himself.

This situation is reinforced by the conjunction of the financial situation and several characteristics of the Javanese concept of money, which are difficult to explain according to European standards. The farmers have no funds and live on credit, while awaiting the next harvest. Thus the pressure increases when the *penimbang hasil bumi* proposes Rp 40,000 cash in a single payment, even if the yield is worth Rp 80,000! Reimbursing debts, education for the children and special family events sometimes even oblige the farmer to sell his harvest 2 to 4 months in advance, pushing this outrageous credit mechanism to the limit.

Moreover, the Indonesian farmer scarcely considers certain farm tasks, be it for personal, social, or economic reasons. Thus one finds rice farmers who prefer to weed their rice fields perfectly instead of harvesting their cassava.

The contract harvester generally heads a team of 4 to 6 labourers per field, who are paid according to the weight harvested. The price is fixed before the harvest after a mutual agreement has been reached on the farm. To estimate the yield of the parcel, the contract harvester judges "on sight" the surface planted, the density of the crop, and the health of the plants. The size of the roots is estimated after 4 or 5 stalks have been pulled up. This type of transaction is frequent in the Indonesian agricultural system, especially for the sale of fruit, in which the price is fixed per tree. The system, though an approximate one, gives a definite advantage to the harvest contractor, because it is easy for him to underestimate the quantity bought from the farmer.

The harvest contractor's second function is to transport the cassava from the farmer's field to the factory, which will make *gaplek* (the cassava is peeled, cut into two longitudinal halves, and dried in the sun to 12-13% humidity) or tapioca (after being peeled and crushed, the cassava is dried in the sun and then pounded into a white flour).

While the farmer sometimes makes *gaplek* himself, he always delivers fresh cassava to the tapioca producers.

The *Gaplek* Factory

These very rustic enterprises employ women and children as temporary labourers to peel and cut the roots. The processing capacity is 10 sacks of fresh cassava of about 80 kg each. per day per person. Work is paid by the piece, at Rp 2/kg for peeling and cutting. Men are employed for maintenance and handling the sacks, at Rp 1/kg.

The factory boss and his day labourers take little care in the processing of

the *gaplek* they produce, for the simple reason that this product is not eaten in the village by relatives and neighbours. but is destined for export and reprocessing in Europe according to the needs of the animal feeds industries.

The Cassava Processing Industries

The two last devaluations (March 1983 and September 1986) doubled the export price of cassava, modifying the sector's balance between the pellet industries and the large tapioca factories. A dual movement of these competing industries began at this time and continues today (see Fig. 13, page 40).

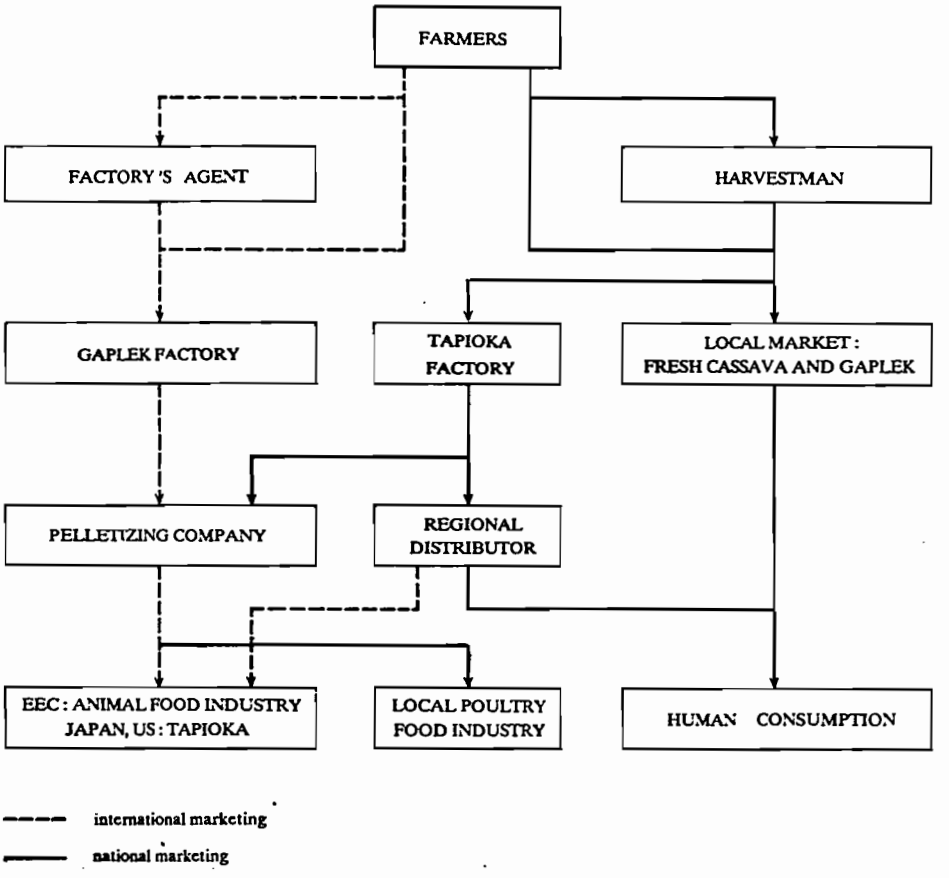

Figure 13 Cassava Marketing in Lampung: Competition Between Local and Foreign Markets
Source: ORSTOM surveys, 1987.

The number of pellet factories increased immediately after the March 1983 devaluation, and the production capacity increased from 4 to 13 units in 4 years. These factories subcontract the drying into *gaplek*, to the small factories in the production zones. They have remained competitive with Teluk Betung, as the transport cost for

the intermediate product (*gaplek*) or the final one (pellets) is the same, as both have about the same density.

On the other hand, the tapioca factories have moved into the production zones and are concentrating in this sector. Since 1983, 5 units of large capacity (750 tons of fresh cassava per day) have entered the production phase or are on the point of doing so in the north-central region of Lampung (in the area of Way Jepara, Sukadana, Menggala, and Terbanggi Besar). Indeed, the last two devaluations have caused an increase in the cost of the raw material, fresh cassava. This increase has not been fully passed on to the price of tapioca flour, which remains set at the national level, as it is consumed in most parts of Indonesia. The result has been a drop in the competitiveness of the small local units (25-50 tons/day), to the benefit of the large units which break even on their costs through larger volumes.

The Tapioca Factories

The situation of the cassava processing units oriented towards the consumer market is very different between the older units (20 years of age, producing 5 to 10 tons of flour per day with drying operations done in the sun for at least four days), that are obliged to shut down during the 6-month rainy season, and the modern units which can dry nearly 20 tons of flour in an hour.

For all these factories, the prime period is harvest time, from June to September (peak in August). The supply conditions are very irregular from one year to the next, as cycles of over-production-like the one in 1984 when the price level discouraged production-alternate with phases when production is limited and prices are high, as in 1986 and 1987.

In the long run, however, it seems that the tapioca sector will evolve as follows: with the appearance in the production zones themselves of large units, the small factories will progressively disappear. Their owners will move to regions farther removed, newly opened in the forest, or to the fields of the national and local transmigration programme and the spontaneous migration movements, which accompany them (Mesuji and Menggala in Lampung). As soon as these factories set up again, they will cause an increase in the production of cassava in these regions, since the crop will be easily marketed.

The role of these small factories is now evident. Much more flexible than the large units, they preserve a great deal of efficiency in the pioneer zones where production and marketing conditions are still fragile, with low production per farm, heavy auto-consumption and lack of infrastructures, making communication difficult for 4 to 6 months a year.

The Pelleting Factories

Indonesian cassava has several competitive advantages with respect to Thai cassava. Its intrinsic quality is better, its level of cyanhydric acid is lower and the percentage of starch higher, due to the almost exclusive use of the sweet varieties.

Moreover, Indonesia's geographic position (southern hemisphere), gives its cassava a considerable advance on the Thai harvest, which allows it to be sold at high prices at the beginning of the season, in October and November.

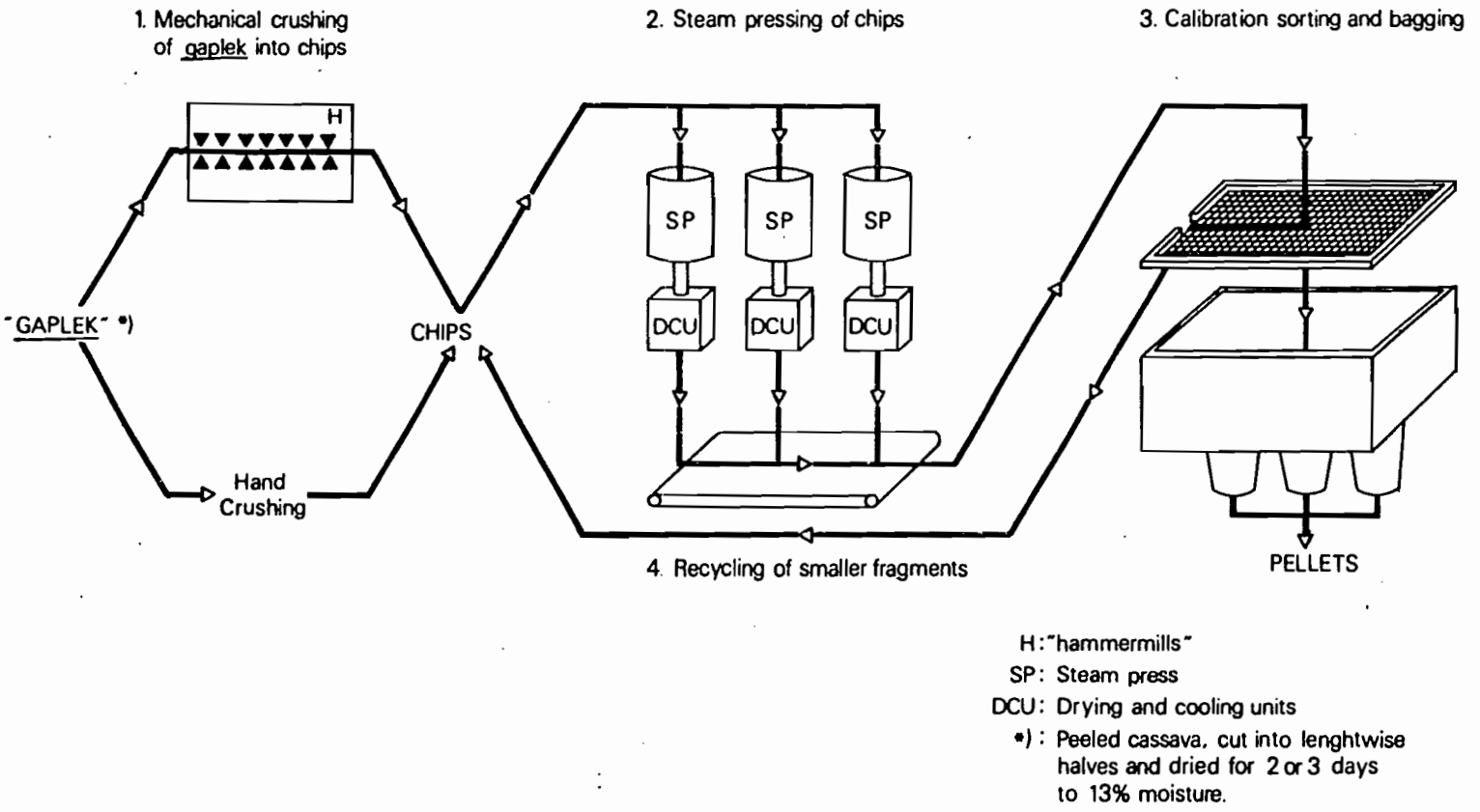

Figure 14 ***Gaplek*** **Processing into Chips and Pellets**
Source: ORSTOM surveys, 1987.

But this advance is countered by the poor quality of the intermediate and end products (*gaplek*, chips and pellets), especially in the regions that have recently been developed like Lampung. This is not only due to the region's climate, which is rainier than on Java, but also to the explosion of the sector.

Since 1983, the number of units has increased from 4 to 13, mainly through the creation of small enterprises. The general structure of export control by the Indonesian authorities, given in greater detail in the chapter on coffee, is also found in the cassava sector. The producer-exporters are grouped in an association, *ASPEMTI* (*Asosiasi Produsen dan Exportir Makanan Ternak Indonesia*, or Indonesian association of producer-exporters of animal feeds) and obligatorily affected to one of the three production groups: Dharmala, Ometraco-Japfa, and Surmadaya.

The fabrication process for chips and pellets is particularly easy (see Fig. 14, page 42):

- chips are made by lightly breaking the *gaplek* into pieces 3-to-4-cm in diameter with a machine (this used to be done by hand);
- for pellets, the chips are simply ground, steam-pressed through a filter with holes 7 to 10 mm in diameter, and dried to 12-13% humidity.

The processing costs for chips is thus less than for pellets: Rp 25/kg for chips as opposed to Rp 36/kg for pellets. But changing from the production of chips to pellets depends on the final profit the transforming and importing companies can make. This depends on the fabrication costs, on the relative durability of the pellets with respect to chips (respectively 4 and 1.5 months), and on the difference in freighting costs between chips and pellets (a cargo ship can carry 20% more pellets for the same volume, which increases by as much the transport cost of chips with respect to pellets). Since August 1987, the cassava exporters have produced exclusively chips, as the difference in price between chips and pellets on the international market has become very slight, only US$ 5 per ton as of 01/11/87 (prices are respectively US$ 120 and 125 per ton).

Along with the usual large German and Dutch importers such as Peter Cremmer, Toepfer, and Gutz, the 1983 cassava boom attracted several Japanese groups like Mitsui, Itoh, and Mitsubishi. This did not occur without causing problems in an already saturated market. Since the large groups wanted to enter the market, they were obliged to buy at any price from anyone who would sell them cassava. Some Indonesian producers, delighted with the situation, provided cassava that seemed correct in quality at first. Before the cassava arrived at its destination, that is, before the buyer realized he has been cheated, the deal had been made. The dishonest exporter had already collected 80% of the total amount paid, via the bill of exchange, leaving the importer to discover, upon arrival, the ruined, useless load that was worth far less than the 80% paid in advance.

Fraud, which is technically easy, is still done today. The load (often of chips) is carefully covered with cinders by the manufacturer, with the outer layer of chips having a 12-13% humidity and the interior still at 30%. This treatment makes the chips look "normal" during loading. But upon arrival in Europe, things are quite different: the entire cargo is completely rotten and declared unfit for any use.

Until 1983, the European importers participated in joint-venture transformation of pellets. Since then, each individual has fallen back on his own strength and competition has become very keen. The import groups have withdrawn from the actual

transformation of cassava chips and pellets, which required little technology and was very easy to copy, especially since laws on industrial property are nonexistent in Indonesia. Today they buy the product ready for use, FOB at Teluk Betung, and organize its expedition to Europe.

The exporter-pellet manufacturers enjoy a very good local implantion, close connections with the authorities, and operating costs that are much lower than the European firms. But, even the largest of these groups, Dharmala, which exports 200.000 tons of cassava per year, is not large enough to obtain sufficiently competitive shipping costs, with at best USS 30 ton of cassava from Teluk Betung to Rotterdam. Thus they prefer to leave this operation to the large importers already mentioned, who have numerous complementary activities in South-East Asia (trade in molasses, palm oil and cakes of rice husks – between Thailand, Indonesia, the Philippines, Taiwan, Singapore, Europe, the United States and Japan). The latter can lower the unit price of transport from Japan to Rotterdam to USS 20-25/ton, by chartering cargo ships for long periods throughout the year.

Despite a great deal of progress, the cassava market is not stable in Lampung and in Sumatra as a rule. A significant example is given by the study of the production processed in Teluk Betung in 1986 and 1987. For the second consecutive year, loads of *gaplek* were sent by truck from Baturaja (Sumatra *Selatan*), Bengkulu, Jambi and Riau to Teluk Betung. These regions are host to many transmigrants who all grow cassava, and there is no factory in these regions. In Palembang, the cause seems to be the "relative" distance from the usual commercialization routes; in Bengkulu and Dumai (Riau) the problem is due more to the lack of ports. But the individual action also plays a role in the market's instability. The hypothesis of a concerted action by a few of the large groups of the time in 1983 and 1984, to maintain prices at their lowest, should not be overlooked. Beginning in 1986, this monopolistic situation in Teluk Betung concerning the fixing of the price of cassava had become more difficult to maintain, due to the entry of new competitors on the markets.

Combined result of these two factors, the price of cassava (in terms of one kilogram of fresh cassava) paid to the farmer in Riau (transport of the *gaplek* by truck: Rp 50/kg from Dumai to Teluk Betung) came to Rp 30-35/kg, or in other words 3 times more than it was three years ago in the Metro region (Lampung Tengah), 60 km from Teluk Betung.

The Large European Importers

Throug buying chips and pellets FOB, the importers pay according to conditions that reflect the risks they face because of the occasionally dishonest practices of some exporters and of the extreme "volatility" of the product (weight loss during transport can be as high as 5 to 7%). While the buying price is fixed before shipment according to quality standard no. 3 (Tab. 33) the exact amount of the transaction is determined upon arrival in port in Europe, where quality and quantity can be precisely measured.

The exports are rather strictly controlled, both by the administration and the importers. As for a number of agricultural products destined for export, the *PPMB* (Centre for Quality Control and Testing), an agency of the Ministry of Agriculture, controls the quality of the pellets and delivers an export certificate. Moreover, the large foreign importers have local agents and pay controllers certified by

the Indonesian Government (as well as the national firm PT SUCOFINDO, a joint-venture project with the GSC or General Supervision Company).

Once present as joint-ventures, the groups that were set up the earliest, gradually withdrew from manufacturing pellets beginning in 1983, as the technology was too easily copied and their production costs were high. It is in fact necessary to produce more than 145,000 tons of cassava per year to bring the cost of one expatriate family to less than Rp 1 per kg exported, which represents 0.5% of the total price of cassava FOB at Teluk Betung.

Table 33 Grading of pellets exported to EEC

Quality reference	I	II	III	IV
Minimal starch content (EWERS)	70%	68%	65%	62%
Maximal fiber content (EENDE)	4%	5%	5%	5%
Maximal ash content	2%	3%	3%	3%
Maximal moisture content	14%	14%	14%	15%

Pellets should be free of:
- pesticides (HCH, DDT, ALDRIN)
- aflatoxin B1 (maximum 0.2 mg/kg)
- cynhydric acid (maximum 50 mg/kg)

Source: Orstom surveys, 1987.

One of the bases for mutual confidence between exporters is the quality and the quantity of the information exchanged. By telefax, each import agent receives a 5 to 10-page summary of the daily market tendencies, and sends a resume of the main points to his 5 or 6 regular suppliers. Twice-daily contacts are standard, beginning in October, when the buying season starts in Europe. The importers, at least for the largest, also have their own information network which transits through Singapore.

The port infrastructure is still insufficient for rapid loading of cassava, even in Teluk Betung, where the length of the quay nonetheless allows for two cassava loaders of 30,000 tons each. In the best conditions, 3000 tons can be loaded per day, as opposed to 10,000 t per day in Bangkok where 175,000-ton cargos can dock. The effect of the economy of scale is highly favourable to Thailand, since shipping costs per ton of cassava are US$ 12 from Bangkok to Rotterdam, as opposed to US$ 20 at best from Teluk Betung.

All operations are done by a great number of manual labourers. There is no conveyor system in Teluk Betung, which is also the case in the other Indonesian ports. This refusal to use machinery is essentially a social one, unemployment being one of the most important issues for the upcoming years. Loading is done in the following manner: labourers unload the 65-kg sacks from the trucks in which the cassava was brought to the quay. After placing the sacks in a pile, the coolies make a net with large ropes, put it around about 30 sacks, and the cargo's cranes hoist the nets onto the ship and into the holds where the sacks are empltied.

Like their employers, the porters do not take many precautions with the merchandise. One finds shoes, bits of sacking or clothing, and other rubbish that does not improve the quality of the load.

The situation has nevertheless improved considerably in Teluk Betung, as seen by the arrival of loads from regions as far-removed as Riau. When the 480 m loacing dock

had not yet been built, it was necessary to load flat barges which then had to be hauled out into the bay to the cargos anchored further out. Given the time required for loading, the cassava's humidity increased by at least 2 to 3%, not counting the damage caused by sacks that fell into the water and were nonetheless retrieved.

Upon arrival, the cassava (chips or pellets) is refined again to be used for animal feeds (composite feeds). The quality of the load is not really a problem, for what is spoiled is thrown away - and the Indonesian exporter receives a lower price. Once again, this illustrates the marginal attitude of those who trade in farm products, whatever the sector.

Conclusion: A potential that could be better exploited

The farm price of cassava depends on the price on the international pellet and tapioca markets. Since the implementation of the CAP (Common Agricultural Policy) and the protection of the cereals market in Europe, it is the price of wheat – which can easily be used for animal feeds – which determines the price of cassava in Teluk Betung. The variations in the price of tapioca are linked to those of several substitute products, the most common being maize flour. The price of pellets, converted to the equivalent in fresh cassava (conversion coefficient 40%), actually determines the limit below which no merchant will agree to deliver to the tapioca industries.

While a system of supply quotas presently controls the amount provided by the producers (Thailand, Indonesia, Brazil, Taiwan and West Africa), to the EEC, Indonesia finds herself in the paradoxical situation of not being able to meet her annual export quota. In 1983 and 1984 this was set at 500,000 and 600,000 tons of pellets or chips, respectively. However, only 257,000 and 400,000 tons of each were exported. In 1986, exports increased to 600,000 tons, but the quota also increased to 825,000 tons. The authorities are very worried about this since, in 1988, the different world partners plan to redefine the GATT (General Agreement on Tariffs and Trade) supply quotas for its various members. Under these conditions, Indonesia's allotment could be reduced.

Several concurrent elements lead one to believe that national demand will increase over the next 10 years. The improved standard of living will increase the consumption of products derived from tapioca: noodles, *krupuk* and other snacks. The regular population increase will boost the consumption of fresh roots.

Indonesia is also interested in the production of sugars and ethanol (food, chemical and energy sector) derived from the refinement of the fresh roots. However, the short-term perspectives remain unencouraging as world prices for sugar and oil are very low. They could nevertheless undergo a boom in the middle or long term, from 15 to 25 years.

In terms of international demand, the situation seems to be contradictory. While the EEC's consumption (pellets for animal feeds), or Japan's and the USA's (tapioca flour), seems to be slowing down, that of many countries in Southeast Asia, given the jump in intensive animal husbandary, is going to increase as will the opportunities for new markets for Indonesian cassava.

With a growing world demand for Indonesian cassava (due to the favourable climatic conditions and the good intrinsic qualities of the varieties used, the market is rather favourable). In the opinion of the pellet importers, the price conjuncture for at

least the next five years will be favourable to cassava production in Indonesia, with farm prices remaining from Rp 30 to 60/kg for fresh cassava.

Whereas on Java, an extension of cassava cultivation through increased surface areas appears to be blocked because there are too many other more profitable openings for the farmers, in the outer provinces, the crop's potential for development is great. In Lampung, the primary production region outside Java, the production level can easily be raised through the use of more productive varieties. Moreover, in the other transmigration zones, even the isolated ones, especially those on Sumatra and Kalimantan, the present price conjuncture allows the *gaplek* to be transported over long distances.

Finally, given the rapidity with which the sector has developed in Lampung since 1983, it is probable that the large groups intend to extend to central Sumatra, but that the limiting factor remains the port installations in towns like Bengkulu and Dumai.

Principal Problems in the Production and the Commercialization of Cassava

Production

Primary upland crop in Lampung, cassava is the typical crop of these disadvantaged regions and has undergone rapid growth with the implementation of the transmigration programs in the 1970's. As with rice, environment plays a major role in the farmers' choice of a cultivation system for cassava (Fig. 15 and Tab. 34).

Table 34 Environment and cassava cultivation

	Lampung *selatan*	Lampung *utara*
Road network	developed	underdeveloped
Farmers' isolation	limited	critical
Demographic pressure	heavy	moderate to low
Pedo-climatic conditions	moderately favourable	moderately favourable
Type of agriculture	commercial	food-crop
Type of commerce	regular, active	occasional
Cassava production	intensive	extensive

Source: Orstom field surveys, 1987.

125.000 ha are planted with cassava in Lampung, producing 1,000.000 tons per year. The commercialization of cassava is handled exclusively by the private sector.

Pedo-climatic Conditions

Cassava resists well to extreme pedo-climatic conditions, in which the soils are infertile and the dry season is severe, as in the northeastern part of the province (peneplain region with red-yellow podzolic soils). However, the reversal of the seasons in the southern hempisphere is an advantage for the earlier Indonesian cassava harvest with respect to that of Thailand.

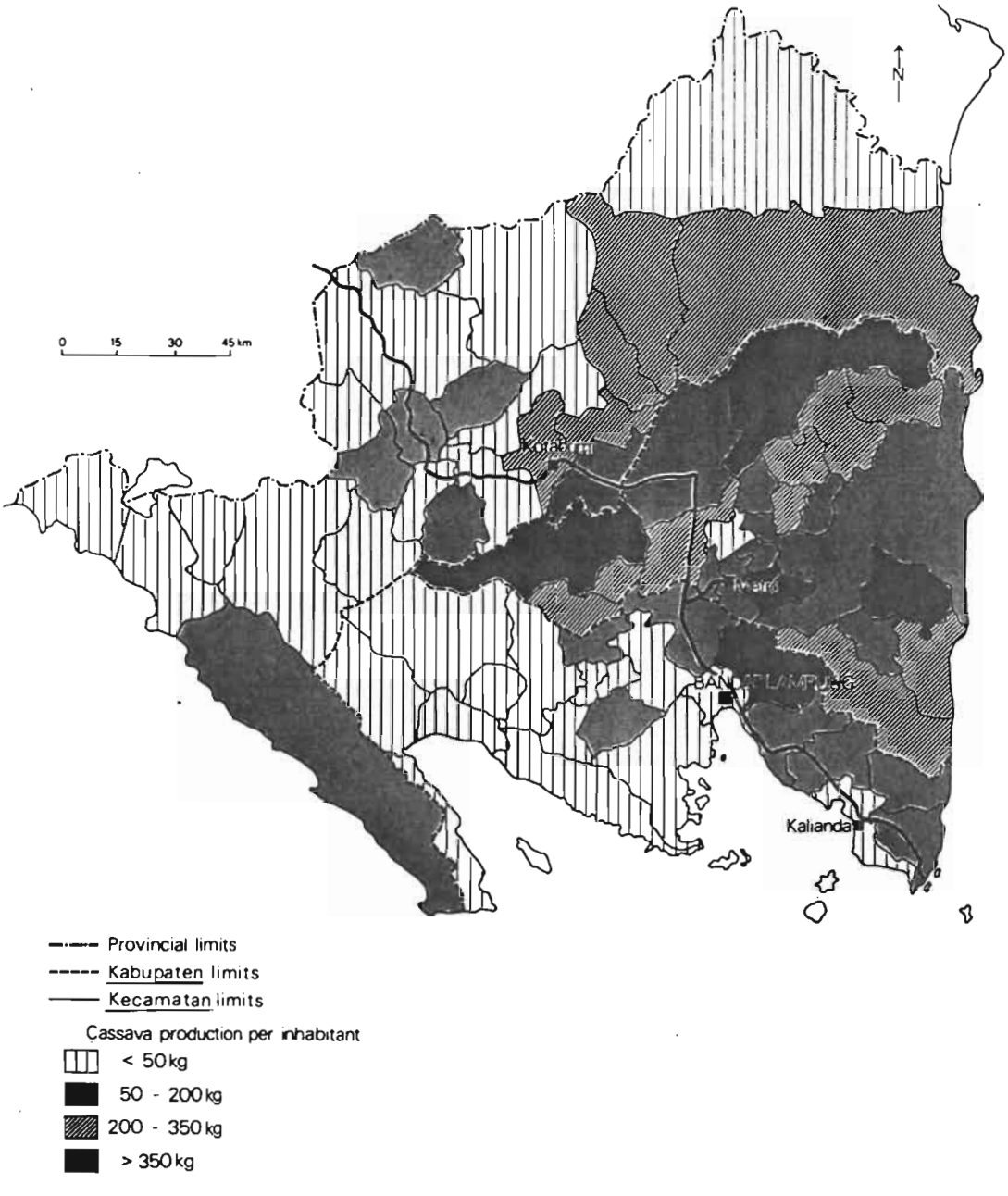

Figure 15 Major Cassava Producing Areas of Lampung
Source: Annual administrative report of Lampung Province, 1983

Infrastructures

This is a determining factor, both for the production and the marketing of cassava, because the transport costs make up a very large part of the final price of this product, whose unit price is low. Near the towns or refining centres, the road structures are good, shipping costs are limited, and access to the villages is easy except in the rainy season (October to April) when delays in transporting merchandise can be from 2 hours to an entire day. Thus, even more so than for rice, the isolated regions are at a disadvantage in the production and commercialization of cassava.

Technical Level, Formation

Contrary to rice, there is no programme for training in cassava farming. Under the sector's present operating conditions, such a programme would be difficult to set up, for several reasons:

- in the regions where the crop could be intensified, the production level varies a great deal from one year to the next, since, unlike irrigated rice farming or plantation crops, every year the farmers can choose to plant either cassava or another cash crop, according to the prices in the preceding year;
- in the isolated regions, cassava is the farmers' basic subsistence crop, and is associated with other crops in the *tumpang sari* extensive production system. High shipping costs, heavy auto-consumption, and uncertain prices for the roots make any future intensification difficult due to lack of funds;
- today, only the crops in the *pekarangan*, in the regions situated near a commercial outlet or under plantation crops and with an integrated processing unit, have acquired a certain degree of intensification, but in a way that does not lend itself to the implementation of a *BIMAS*-type formation programme.

Financing

The number of unfavourable factors that hinder the implementation of a technical formation policy also prevent the creation of public financial aid for the sector; in the form of credits and management of the production supplies, creation of *kelompok tani* (groups of producers) or of *KUDs* (village co-operatives).

Commercialization

Transport

As for the rice sector, shipping is handled mainly by specialized companies. However, at the higher levels of the chain (cassava exporters, large integrated plantations and tapioca factories), shipping the cassava to its final destination (towns for the tapioca, Bandar Lampung port for the *gaplek* destined for export after processing) is often done directly by the merchants concerned. Transporting the chips and pellets from Teluk Betung to Europe is handled by the European importers, who can obtain more advantageous shipping conditions than the local exporters.

In the final price of cassava delivered to Europe, more than 33% is shipping costs. This high percentage is due to a lack of infrastructures. On the one hand, road transport from the isolated production zones to Teluk Betung remains expensive (Rp

50/kg of *gaplek* from Jambi to the capitol of Lampung). Moreover, it costs US$ 22/ton to ship from Teluk Betung to Rotterdam, as opposed to US$ 12 from Bangkok to Rotterdam, which is a good example of the relative inefficiency of the port installations in Panjang.

The situation has improved since the Panjang loading quay was enlarged to 480 meters, allowing middle tonnage cargos (35,000 to 40,000 tons) to dock. At prices favourable to its commercialization, like those in 1987, Panjang port receives *gaplek* from regions as far away as Riau and Jambi. But the loading times remain too long, which is harmful to the quality and increases the price of the exported products. There are neither storage silos nor a conveyor belt at the port. The situation is the same throughout the island, except in Medan (North Sumatra); South Sumatra lacks a large, modern port.

Transformation

There are two principal industrial transformation methods for cassava in Lampung. When it is destined for shipment to Europe (animal feeds sector), it is first dried, peeled, and cut into *gaplek* in the village, in order to lower the transport costs and allow the cassava to be stored. Upon arrival in Teluk Betung, the *gaplek* is refined according to an inexpensive transformation method, into chips, or chushed *gaplek*, and pellets (steam-pressed chips dried to 13-14% humidity). Each intermediary is not very careful about the quality of the products he sells, and in the end it is the farmer who loses the most through these careless methods.

When the cassava is destined for the internal market (consumer sector), it is peeled, crushed, dried, and ground into a white flour, tapioca. As the roots must be processed while fresh (maximum 3-4 days after harvest), the tapioca factories are located in the production zones in order to limit the costs and risks of shipping the cassava from the fields to the refinement unit. The traditional factories dry their cassava in the sun, and thus are operational only for 6 months, during the dry season. Given that the tapioca is destined for national human consumption, the quality of the final product receives greater attention in this sector,than the export product.

Storage

Drying the cassava before storage is absolutely necessary for its conservation. On the farm, the farmer stocks small quantities of dried cassava for his own use. Most of the cassava produced is stored by the exporters, tapioca factories, and agro-industries. The conditions under which this is done are often mediocre. The hangars are very old, too small, poorly-ventilated, and often leak. There is no rational management of the stock despite the fact that the quantities are sometimes quite large (20,000 to 30,000 tons in August and September). The dates on which the "*gaplek*" was received or the chips and pellets processed are not recorded, which prevents the optimal storage times from being respected (pellets: 4 months, chips: 1.5 months).

The Cassava's Quality

Indonesian cassava has two advantages with respect to the Thai variety:

- the varieties grown are essentially sweet varieties (*Adira I, Muara*), with a low level of cynhydric acid;

- the climate of the southern hemisphere leads to an earlier maturation of the roots than Thailand.

These advantages are not put to good use in Indonesia, which cannot meet its EEC export quota (600.000 tons in 1987, as opposed to a total annual production of 14,000,00 tons). They are even wasted by the careless refinement of the cassava into chips and pellets, with every agent's intervention providing further hindrance in every stage of the chain: drying and transport conditions in the village, manufacturing the *gaplek*, refining into pellets, handling, storage, and intentional damage done by the exporters, lack of interest on the part of the importers in terms of any improvement in the quality of their supplies.

Stricter control by the *PPMB* (Centre for Quality Control), as well as encouraging the existing competition between the Indonesian exporters, could nevertheless, help to improve the quality of the cassava exported in the near future, which would be directly profitable for the farmers.

Information

While the available market information at the export level is quite sufficient to run their commercial operations, it is practically non existent on the farms. There are no standards or payment according to quality. The cassava is bought per kilogram of fresh roots, no matter what the percentage of humidity, of starch, or fibre. The cassava farmer usually lives in isolated zones and has no active local market to refer to.

Financing

At present, the public sector provides little financial aid to the farmers' for commercialization of cassava. Such aid is faced with the same constraints as that of production: farmers' isolation, high auto-consumption, variable price for roots from one year to the next, which make it difficult to situate and evaluate the amount of production, and extensive cultivation associated with other food crops.

The Economy of the Sector

See also Tables 54 to 57, pages 86 to 89.

Prices

The price of cassava varies greatly from one year to the next, and this hinders any form of controlled, regular development of the crop. Since the farmers have no precise standards of quality, prices are fixed according to many subjective factors. The relationship of buyers to sellers remains more important than objective criteria (% humidity, % starch, % impurities). Thus, the *penimbang hasil bumi*, or harvest contractor, sets the price per hectare harvested and the village factories buy the cassava per kilogram of fresh roots. When large quantities are sold, such as between exporters and European importers, the international standards are closely followed because the financial risks are, in this case, very high.

Development of the Sector

The short- and middle-term stability in the demand, the good intrinsic quality of Indonesian cassava, and the goal of increasing the farmers' incomes justify an improvement in the farming conditions for cassava in the outer provinces of Indonesia. This would also allow for the use of relatively fertile land on Java for more profitable crops and for the extension of the transmigration zones to the newly-opened regions where cassava would be a reasonable speculation given the difficult pedo-climatic conditions.

In the well-developed part of Lampung (Lampung *Selatan* and the southern part of Lampung *Tengah*), intensifying the crop would be easier due to (transport and information facilities and nearby processing plants. But the most important objective should be improving the production and marketing conditions in the isolated regions, because the farmers there are forced to grow and depend primarily upon cassava.

Increasing the export quality is a prime goal that can be met by the cassava sector in Lampung. Developing more efficient port facilities, improving road networks in Lampung *Utara*, establishing standards for the farm transactions and a system of payment according to quality would be the factors of a long-term solution, though difficult and costly to implement.

On the other hand, improving the *PPMB's* quality control of the pellets and chips and extending this to the *gaplek* upon its arrival in Teluk Betung, plus direct aid for the farmer, could be rapidly implemented at a lower cost.

In the isolated regions, top priorities would be technical formation and financing: research in the selection of varieties and adequate systems of production; and creation of producers' unions.

However, efforts toward improving the marketing conditions should be made in the province as a whole, because cassava has a low profitability which should be increased at the farm price level. Also, and even more so than for rice, the size of the collective commercialization structures is critical, as it must be sufficiently large to allow for credit financing of the necessary investments for good-quality processing in the village (collective protection of the harvest from wild pigs and elephants, drying floors, storage hangars, humidity gauges and scales in sufficient number). But it should not be too large in order to allow the farmers to manage the groups efficiently.

With the probable drop in the consumption of fresh roots, which will be replaced by that of more elaborate products derived from cassava flour, it would be interesting to make a careful study of the advantages offered by a second refinery in the village, run by small private firms. Such a possibility would allow for an increase in profits in the very production zone itself, as well as creating jobs, thus increasing the farmers' incomes.

As in the rice sector, new types of contracts between producers, transporters, and merchants should be encouraged. These would: i) help bring transport costs down; ii) stabilize the amount of time needed; iii) increase the farm prices, iv) improve the quality of the merchandise supplied by the farmers, and; v) provide funds for emergencies or for auto-financing of the communities (systems of advance payment from the merchants and village's collectivity's treasury supplied by a percentage of the sales income). All these elements would ensure an improvement in the standard of living of all the farmers, even the most isolated ones.

4

Coffee Marketing in Lampung

Processing and Collecting

The Small Planter Still Uses Traditional Methods

Generally owning 1 to 2 hectares of coffee fields, the small planter uses very extensive techniques: fertilizers are rarely employed. Yields average 500 kg of market coffee per year, whereas they could be tripled simply by improving the manner in which the plantations are run (especially in terms of pruning).

There are many reasons for this. The newly-opened zones have relatively fertile soils, where the coffee plantations have good yields during the first productive years, without any particular care. The isolation, the difficulties in transport, information, and marketing, all increase the production costs in high-altitude regions. Thus one kg of fertilizer cost Rp 145 on October 10, 1987, and Rp 250-300 at 2 hours by motorcycle from the last stretch of asphalt road, which represents a common level of isolation.

Moreover, the lack of economic calculation and certain Sumatranese ethnic groups' refusal to change, also hinder the adoption of new technical improvements and the development of the sector. Historically underpopulated, these regions have never known many land problems. This encourages the small-scale planters to continue their traditional system of shifting cultivation (itinerant cropping using slash-and-burn techniques). When their plantation falls off in production, they open a new one rather than investing more heavily in a single plot.

Processing the Coffee in the Hamlet Considerably Reduces the Quality

Indonesian coffee and Lampung's in particular, have a bad reputation on the world market. Up to last year, they underwent an automatic deducation of 2.5 Sterling Pound/ton in their simple exchange rate on the London stock market (Fig. 16, 17 and 19).

Many factors contribute to the loss of quality at the village level. At harvest time, the labour is insufficient, especially in the distant regions, so the owners harvest by "strip picking". They collect all the grains from a single branch without taking into consideration the degree of maturity. But grains harvested too soon dry more slowly, tend to blacken and produce a less-flavourful coffee after roasting. Even more serious, the coffee production zones are very rainy during the harvest period (from 150 to 200 mm/month). In many isolated villages, coffee is dried directly on the ground. If it rains, the coffee is covered with a canvas, which does not keep it from getting wet from the water that runs under the canvas. Finally, due to transport costs, the coffee is shelled in the village, where the farmers still use small wooden shelling instruments. These cause a very high percentage of broken or damaged grains.

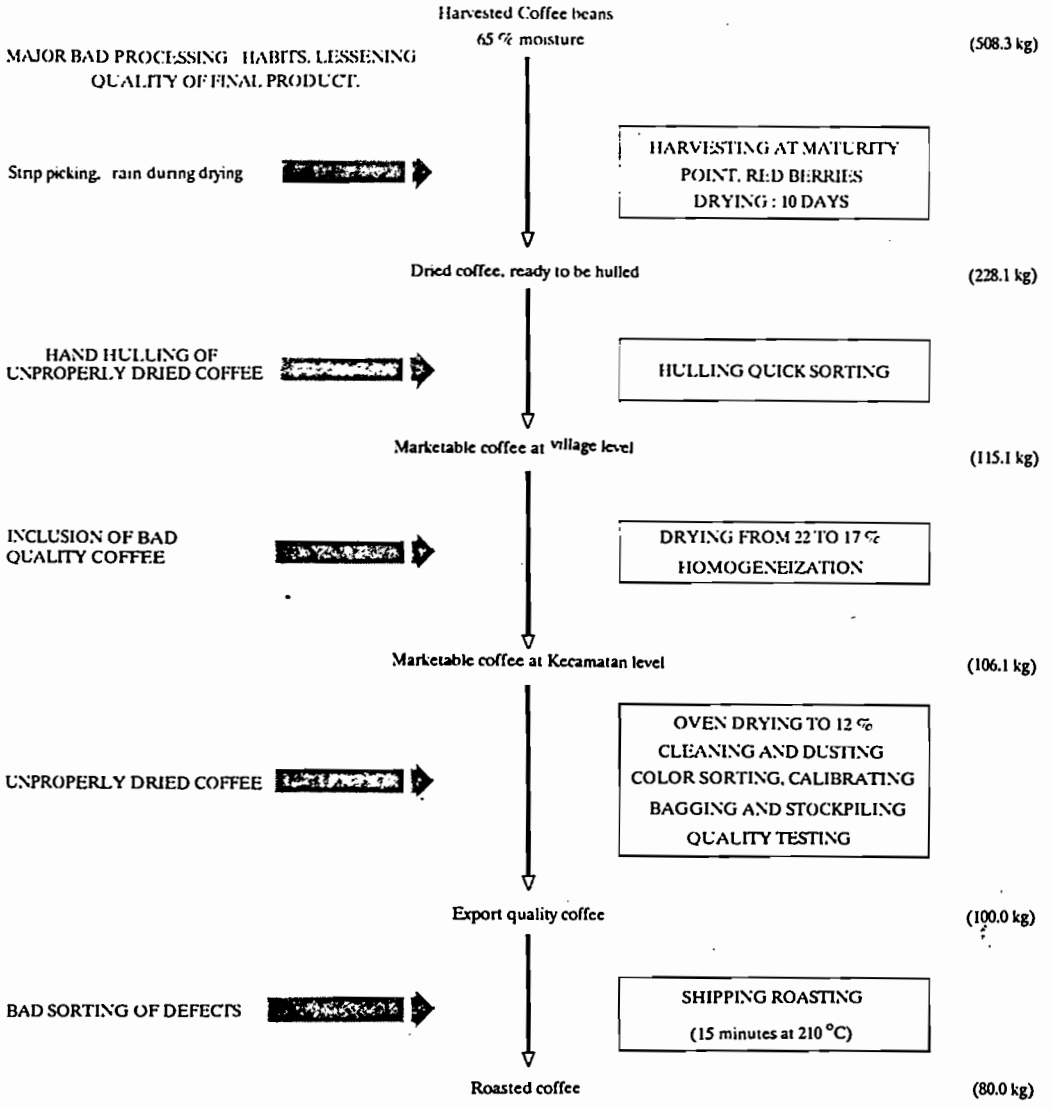

Figure 16 Coffee Processing
Source: "Le cafeier", and ORSTOM surveys, 1987.

On the other hand, in the northern part of the province, the coffee is processed with greater care at every level of the sector, because it has a better intrinsic quality. It is not rare to obtain 80 kg of *EK*-grade coffee from 100 kg of farm coffee. The commercial agents are often paid a commission according to the quality, and the large-scale collectors sometimes carry out a preliminary hand sorting of the *EK I* (export quality 3-4), *KB* (export quality 5-6) and *asalan* grades (the latter is reserved for the internal market; Tab. 35

Table 35 Coffee grades according to moisture and "triase"

Coffee quality	Moisture %	"Triase" %
EK 1	16	14
KB	17	20
North Lampung *asalan*	20	26
South Lampung *asalan*	20	26

Source: ORSTOM field surveys, 1987.

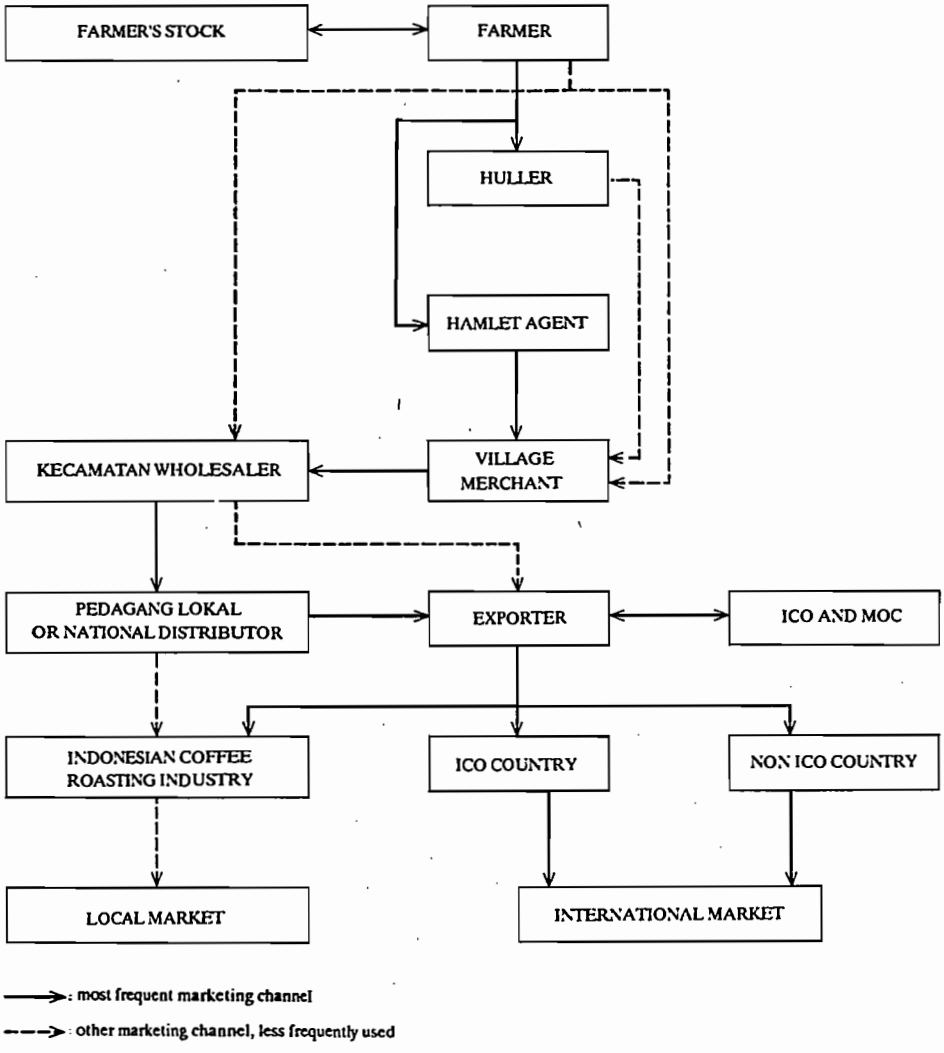

Figure 17 Highland Export Coffee Marketing
Source: ORSTOM surveys, 1987.

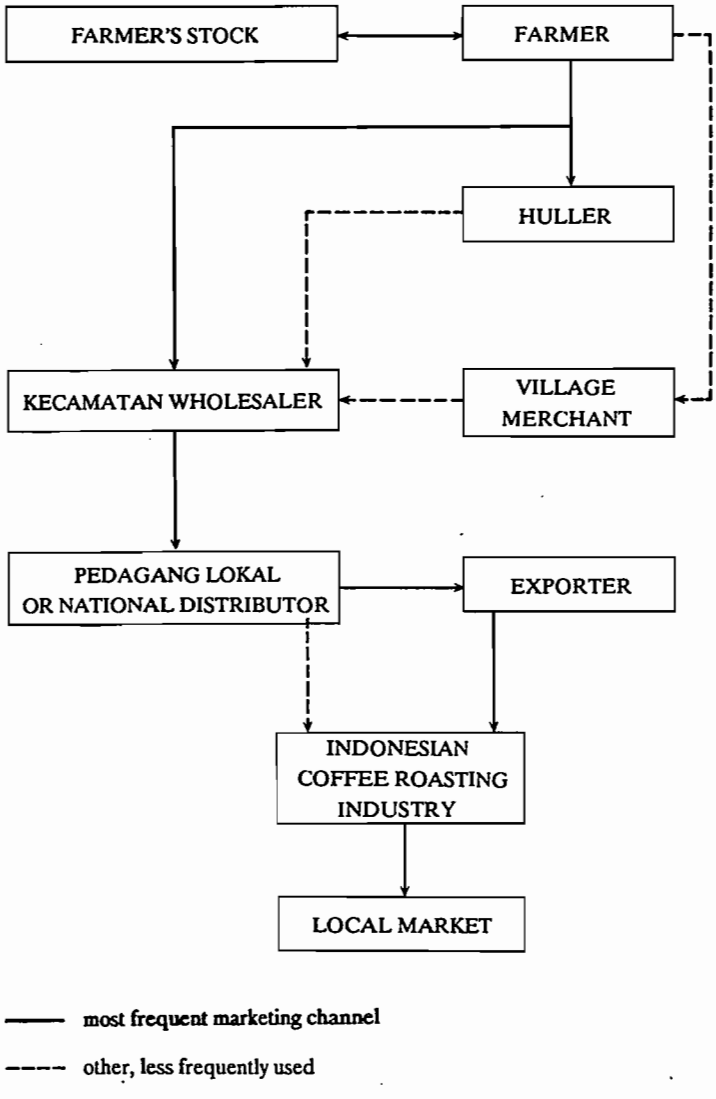

Figure 18 Lowland Coffee Marketing
Source: ORSTOM surveyss, 1987.

From the Hamlet to the Village: A Particularly Hazardous Operation

The region's difficult access have made the *tukang ojek* (young motorcycle drivers carrying people and goods on the mountain trails in Lampung), an indispensable part of daily life. This dangerous and noisy means of communicating between the small isolated plantations, has very high tariffs due to the risks the drivers.

The most talented -and the most careless, transport up to three 160-pound sacks per trip on their 125cc motorcycles and make four 2-hour trips each per day. Their gross profit can reach Rp 150,000 per day during the coffee harvest, without counting

the frequent necessity of new motorcycles, since these do not last long under such treatment (Tab. 36).

Table 36 Motorcycle freight cost in Lampung mountains

Time	Distance km	Freight cost Rp/kg
1 hour	20	100
2 hours	40	200
3 hours	60	300

Prices increase by 50% in case of rain
Source: ORSTOM field surveys, 1987.

At this point, the farmer carries out the sale of his dried coffee in several ways:

- either he sells it directly in his village to the *tukang ojek*, or an agent in the hamlet. He is then paid in cash, but receives a much lower price than the one he would have gotten if he had gone to negotiate himself. He takes no responsibility for the risks in transporting the coffee to the valley.
- or he hires a *tukang ojek* and takes his merchandise to the village market himself. According to his needs, he either sells directly, is paid in cash with 1-2 days' delay, or leaves his stock with the merchant. In exchange for this service (certain mountain hamlets are still unsafe and coffee is still frequently stolen), the merchant is certain he will sell all of this farmer's coffee.

The Small-scale Merchant Maximizes his Profit by Diminishing the Quality of the Coffee he Collects

In the most populated hamlets, a motorized shelling machine that can handle both rice and coffee can be profitably installed. Its owner often runs a plantation outside the coffee shelling season. He practices a *bawon* of 4%; in other words, he is paid in kind for his services (4 kg per hundredweight of coffee processed). The farmer generally comes back for his production because this middleman, unless he has set up a confidential relationship with a boss, is just as limited in his commercialization capabilities as the small planters he is supposed to represent.

When he buys coffee from the farmers, he has few standards of quality to help him set the prices. The percentage of humidity is estimated by hand and the other criteria "on sight" (colour, size of the grains, amount of broken or damaged grains). With some practice, this empirical estimation can be quite precise, at 1% of the percentage in water.

But the merchant generally takes advantage of this situation. He lowers the price of poor-grade coffees as much as possible, claiming his future difficulties in reselling them. He does not pay any extra for good quality coffee, especially in the lowland regions, because his objective is, at least in South Lampung, to homogenize the amounts collected. In North Lampung, he is more careful when he obtains extra money from the boss for good-quality supplies.

The coffee collected in this manner is still brought down from the mountain hamlets, by motorcycle, to the more populated areas.

The First Exchange Centre is in the Village Marketplace

At this level, the coffee merchant can collect more coffee, from 500 to 1,000 tons/year, which represents 5 to 10 tons/day during the harvest period. He no longer works the land and devotes himself solely to commercial activities (grocery shop, commerce in other agricultural products, etc.). The hamlet in which he lives is the focal point for all the planters in the surrounding area due to its market.

His installation is often older than those of the merchants in the upland hamlets, dating from the 1970 coffee boom which was the most profitable period for the sector.

This type of middleman is the centre of a very fragile system of economic and financial distribution. The intermediary can borrow up to 10,000,000 Rupiah per day from his boss during the harvest period, which he will redistribute to his *anak buah*, or commercial agents (loans of 500,000 to 1,000,000 Rupiah per collecting day in the more isolated hamlets).

This type of credit system is a definite advantage for the *anak buah* who does not have the funds necessary for financial independence. The literal translation of this Indonesian term, "baby-fruit", also clarifies the nature of the relationship between the boss and his workers. It can be understood as follows: the boss represents the father-figure, the tree which provides life to his *anak buah*, his children, his fruit. He feeds them and keeps them alive, and they owe him respect and loyalty in return.

The agent takes few financial risks and work on a margin, which is exclusive in supply as long as he has no capital of his own. So the system operates essentially according to the rule of confidence. If the small-scale merchant tried to cheat his boss, he would be automatically excluded from commerce and would have no other option but to move and start again from scratch.

In the same manner, he does not participate often in speculative storage, since the price and market information at his disposal remain very limited, although in North Lampung, some merchants listen to the BBC every morning, without understanding any English, to get the coffee prices on the London stock exchange.

While information on the rise in world prices has "trouble" getting down to the village level, any drop in prices is very rapidly passed along the chain through a system of walkie-talkies loaned by the large merchants in the *kecamatan*. This system, which is a safety factor for the small-scale merchants, was only set up in the early 1980's. The reason for this is simple and is one of the foundations of the commerce in agricultural products and relationships between a boss and his agents: all bosses buy from their agents at a price set in advance and must give them this price no matter what happens.

The First Link Between the World Market and the Isolated Regions in Lampung: The *Kecamatan* Boss

This boss can collect a great deal of coffee, from 25 to 50 tons/day during the harvest, thus up to 6,000 tons per year.

Chinese or Sumatranese, either he or his family have lived in the region since the 1960's, in the villages that made up the pioneer areas of the time and which have become small, lively towns, the present seats of the *kecamatan*.

With his commercial network of 25 to 50 *anak buah*, most of whom he finances, he covers 2 to 3 coffee-producing *kecamatan*. According to the rule of maximum

profit, his buying and processing attitude can vary widely. When he delivers to an exporter, which is most often the case in North Lampung, he carries out a rapid hand sorting of the coffee into three qualities: *EKI*, *KB*, and *asalan*. The sorting machine is an investment that is not profitable at his level, Rp 50.000.000. When he must fill an order for good coffee, his *anak buah* are paid according to the quality of the product they bring in. When he delivers to the *pedagang lokal*, or local merchant, he homogenizes the coffee, mixing the very poor quality with the best, trying to obtain an average quality at the least cost.

As he works on a large scale, he must fix the quality of his supply with great precision in order to reduce the risks. Thus, for each transaction which exceeds a hundredweight of market coffee, the testing device is always used, and the *triase* or percent of damaged grains is determined by hand. The resale, which takes place respectively in 90% and 10% of cases in Teluk Betung and Palembang, is also done according to very precise standards of quality and price. Thus, the price differences on September 4, 1987 between the 4 grades of coffee used were as on Table 37.

The flexibility in terms of the employment of labour in these enterprises is as impressive as their financial power. The combined treasury and stock represent 10 collecting days, i.e. 400 to 600 million rupiah.

According to his ethnic origins and his character, the *kecamatan* boss will agree to work closely with an exporter or a major Chinese *pedagang lokal* (or coffee merchant living in Teluk Betung). As a rule, the Indonesians of Chinese descent profit from these connections, which are often family ones, in order to increase their financial possibilities. The money they can borrow is progressively reimbursed as the resulting tacit supply agreement they have established is realized.

Table 37 Green coffee wholesale price in Teluk Betung

Coffee quality	Moisture %	"Triase" %	Base price* Rp/kg
EK 1	16	14	2,600
KB	17	20	2,400
North Lampung *asalan*	20	26	2,200
South Lampung *asalan*	20	26	2,000

* Price on September 4, 1987
Source: ORSTOM field surveys, 1987.

On the other hand, native Sumatrans hesitate to enter such agreements in order to preserve their freedom of movement. They assume the resulting risks alone. For instance, one large Lampung merchant from the northern part of the province found himself with a stock of 150 tons bought in December 1986 at Rp 3,500/kg. On Sept. 1, 1987, it was worth only Rp 2,300/kg. Thus he found himself, with 525 million Rupiah in stock with no possibility of borrowing this sum from a "friendly" merchant in Teluk Betung, like his Chinese competitor who made the same bad deal.

Despite these often delicate inter-ethnic problems, the exchanges of information on prices and market evolution have improved greatly over the past few years. In 1962, when *kecamatan* Balik Bukit (town of Liwa) had only one dirt road to South Sumatra, it took at least 15 days through 350 km of jungle to get from Liwa to Palembang.

Since 1983, the merchants (mainly the exporters) in Teluk Betung have paid for complete radio equipment for their principal suppliers and contact them at least 3 times per day. Here again, this system of information was installed to reduce the financial risks of the bosses and exporters in Teluk Betung, and to increase the efficiency of their supply system.

Coffee Marketing: Export

Collecting the Coffee for Export is Done by the Chinese *Pedagang Lokal* in Teluk Betung

These businessmen own firms that are similar in structure to those of the *kecamatan* bosses. They finance the collecting operations through a system of village or *kecamatan* agents, and regularly supply the 2 or 3 exporters with whom they have close commercial relations.

The role of these merchants is essentially to supply money on both ends of the commercial chain. They do not carry out many operations on coffee; at most they sort the grains to remove any remaining dust or shells that could burn during the drying operations, and proceed with a light drying in an oven from 17-19 to 15% humidity.

They sell 90% of their coffee (of inferior quality or equal to grades 5-6 of the ICO - International Coffee Organization - which were formerly exportable under the name "robusta 20-25") to exporters. The remaining 10% is destined for the local coffee refining industries.

Control of International Commerce Through a System of Export Quotas

The present over-production on the world coffee market, which already dates back 30 years, has led both producer and consumer countries to set up a system of export quotas per country. This system, run by the ICO, is designed to preserve price and production levels that are acceptable to both the producer and the consumer countries.

Based on this structural fact, the coffee exporter's function is relatively simple:

1) He can either be financially independent or work with the *pedagang lokal*. He usually has the means to transform his raw coffee into export-quality coffee.

2) Over the 4-month harvest period, he selects and stocks, with his local collectors, enough coffee to ensure regular supplies for the world market for the entire year. He handles the risks of the price variations, which explains part of the margin he appropriates.

3) He negotiates the different administrative formalities with the Ministry of Commerce, attesting to the fact that his merchandise regularly corresponds to the ICO standards. He participates in the transport of his coffee to its export point, which can be a relatively complex operation.

When, for any reason, (quota attributed by the administration already filled, or no longer valid), he cannot export on his own behalf, he can assume the role of a *pedagang lokal* and organize shipment by road or boat to other enterprises with which he has close commercial relations. These will be able to export his coffee.

4) After negotiation with his foreign clients, who for the most part have offices in Jakarta, he arranges for shipments of coffee-always sold CIF (Cost of Insurance and Freight)- out of Indonesia to the consumer country.

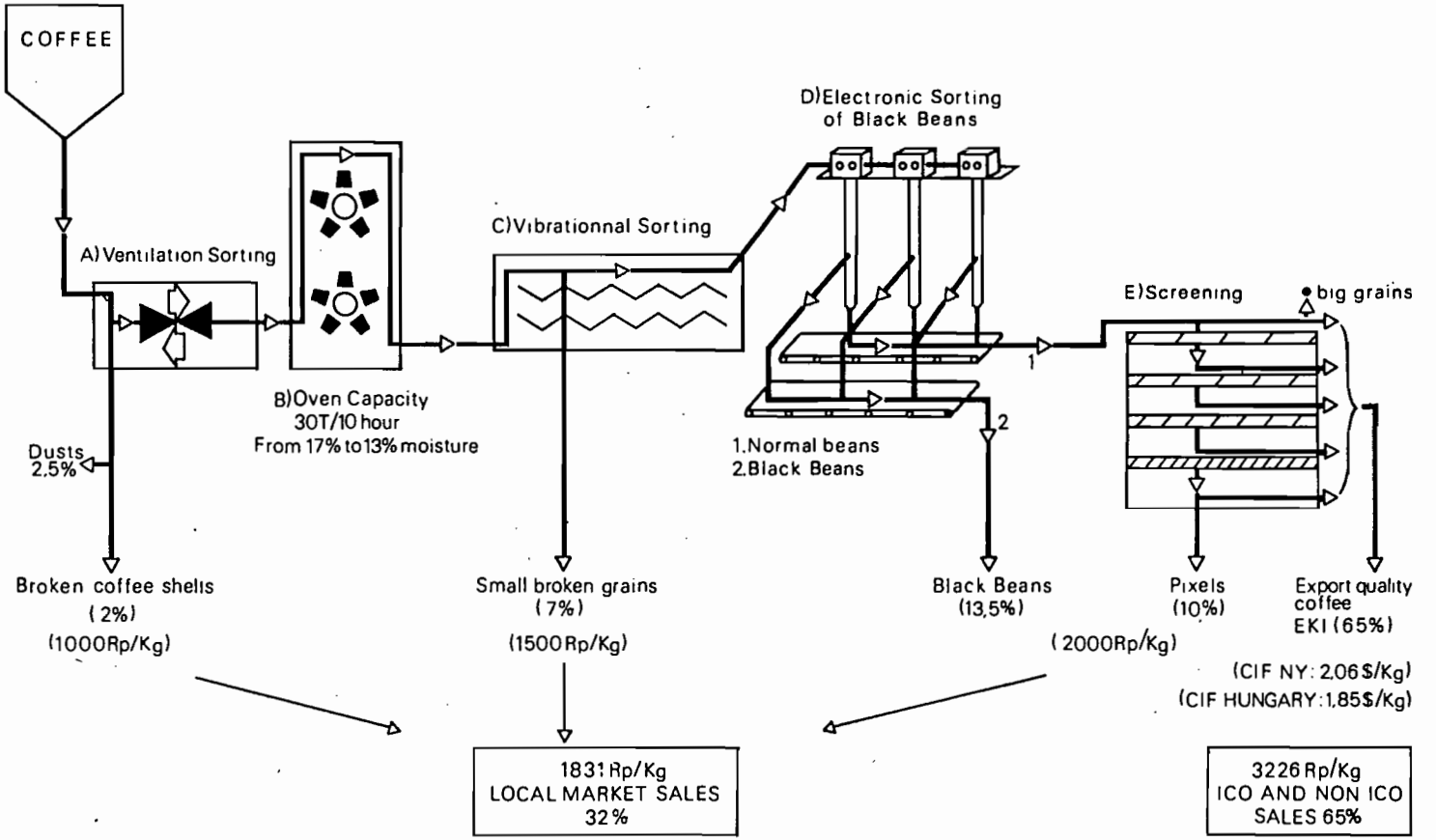

Figure 19 Export Quality Coffee Processing
Source: AEKI & ORSTOM field surveys, 1987.

The exporter frequently has quality information, since he has daily contacts with the large international coffee markets (New York, London), via his main clients. For the most efficient wholesalers, the rapidity of communication fully equals that of Europe. After the revolutions brought about by the telephone, telex, CB radios and short-wave, all quite generalized today, he now has at his disposal computer systems and telefax, which speed up his commercial transactions considerably.

Since 1979, under the influence of these new communication techniques, the sector's evolution is being felt on the market level. The importance of the traditional market, Holland, where coffee is re-exported to America, has considerably fallen in favour of more direct contacts (United States, Japan).

A Policy of Improving Quality on the National Level

Given the very poor reputation of the Indonesian export products and coffee in particular, the Ministry of Commerce responded in 1979 by widening the functions of the *PPMB* (*Pusat Pengujian Mutu Barang*, or Centre for Testing and Quality Control), which is charged with testing and verifying the quality of the products destined for export. The *PPMB* has a definite impact on the improvement of the qualtity of export goods (the verification is accompanied by a classification of the exporters that, in the end, surves to fix the distribution of the coffee quotas). All that remains to be done is to widen the *PPMB's* scope of action as:

- it is not, at present, authorized to control the quality of the products destined for the internal market, and
- it is not, for the moment, authorized to apply the penalties for infringing the ICO rules.

The Ministry of Commerce: An Obligatory Relay Point in the Coffee Export Procedure

Indonesia's total export quota to the ICO member countries was 165,000 tons in 1987, to wit, half of its production (Tab. 38).

Table 38 Market openings for Indonesian coffee (1987)

	Tons per year
Total production (estimation)	390,000
ICO exports	165,300
Non-ICO exports	120,000
National consumption	80,000
Surplus	25,000

Source: ORSTOM field surveys, 1987.

As the international market is particularly limited and Indonesia has 313 export licences, a new arrival can no longer officially enter the market except through buying another merchant's licence.

Today, the average export quota to an ICO member country, per licence, is about 500 tons/year. The number of actual exporters is difficult to quantify, since they can

choose between several strategies in using their licence. Depending of the amount of freedom they have in their business:

1) They can have their own processing unit and market, and can export by themselves, the amount of coffee corresponding to their quota (for large exporters: from 3 to 7,000 tons/year).

2) They can hire the services of a local factory to prepare the coffee for export. This is frequently done by small-scale exporters who have retained financial autonomy through other activities such as import/export, manufacturing, services, plantations, etc. (for the small exporter: 400 to 800 tons/year).

3) A *pedagang lokal* with no quota can collaborate with a licenced exporter who then handles the commercial and administrative operations, sharing his quota in order to profit from financial security and ensured supply. In this manner, the large *pedagang lokal* can participate in the exportation of large quantities, from 2 to 5,000 tons/year.

Whether to export to ICO Countries or Not

Even when the exporter has obtained an assured annual quota, the export procedure remains strictly controlled by the Indonesian administrations.

Every year, the *DPDG* only distributes half of the ICO quota to licenced exporters. The other half is then distributed throughout the year, in the following manner: each ton of coffee sent to a non-ICO country at 70 to 90% of the international market price, earns an extra quota for an ICO country.

The *DPDG* is not the only organization with which the exporters must negotiate, as shown by the calendar of operations that must be carried out for each expedition outside of Indonesia. Once the order is received from a foreign client along with the accompanying Bill of Exchange, the exporter must fill out at the *DPDG "Kanwil"* (regional agency) the first series of letters authorizing him to use his quota. This precisely defines the finances necessary to recuperate the export tax, which is 5% of the total amount.

After having tested and defined the quality of the merchandise himself, according to the international scale (grades 1 to 6), the exporter fills out the *SPM* (*Surat Pernyataan Mutu* or quality determination form for exported goods) and has a *PPMB*-authorized regional laboratory take a sample which is tested within 1 to 3 days. Though this *SPM* certificate is not sent with the exported merchandise, this procedure is obligatory and allows the *DPDG* to effectively supervise the exporters' milieu. Finally, the exporter arranges the terms of maritime transport and finishes with the customs forms at the port authority's office.

Thus, in Teluk Betung, the term "exporter" signifies in fact a great many different situations. Between the large private exporters and the small ones with multiple activities (exporting pepper, running a bus company, grocery shops, printing shop, car repairs etc.), fall the nationalized export companies (PT Tjipta Niaga in Teluk Betung) or the regional export firms (PD Wahana Raharjo for Lampung).

Storage, be it speculative or to ensure future supplies, is done for the most part by the exporters and local merchants. The decision to store coffee depends more on the financial capacity of the merchant than on his function or position within the sector. The hangars and the processing units are regrouped in the Panjang industrial zone, near the loading docks.

Almost loads of coffee all transit through Singapore (second largest shipping port in the world after Rotterdam, with 400 cargos per day). This transit is obligatory for many destinations, like the East Block countries, as no ship serves them directly out of Teluk Betung or even Jakarta.

Combined with the fact that the loads of exported coffee rarely exceed 200 tons and that they require correct care and storage conditions in the ships' holds, the cost of maritime transport is high, at almost US$ 100 per ton for the Teluk Betung-New York route via Singapore. In comparison, the cost of transporting a ton of cassáva from Bangkok to Rotterdam comes to US$ 12.

Due to the difference in prices between the coffee sold to the ICO members and that sold to the non-members, many types of coffee that have as an officially-registered destination, a non-member country, are in fact shipped to member countries. Thus the regulation for trans-shipping in the transit ports has become much more severe since 1983: each non-ICO importer must send the itinerary sheet to his ICO exporter, correctly filled out and attesting that the operations have been done correctly. Most often, this is handled by an import specialist who collects the coffee in the European port to send it to the torrefaction industries. These measures did not prevent Robusta I from costing US$ 2.06/kg on November 1, 1987 in New York, as opposed to US$ 1.85/kg for the loads destined for the non ICO countries (In this case, Hungary).

In contrast to cassava, coffee has a very high added value, which allows ten middlemen (refiners and merchants) to participate in its transport from the mountainous production zones to the European consumers. Along the way, the price for the coffee will have tripled.

Principal Problems in the Production and Commercialization of Coffee

Production

Coffee is the primary plantation crop in Lampung, with 160,000 hectares for a total production of 80,000 tons. The worldwide over-production, and the varieties of coffee planted (99% Robusta, which does not pay well in terms of the efforts required to improve the quality), cause the coffee from Lampung to be underpriced on the world market due to its mediocre quality. As in the rice and cassava sectors, the type of environment plays a major role in the farmers' choice of a coffee production method.

The 1977 boom in coffee prices has profoundly modified the sector. Many migrants have opened plantations in isolated, ecologically fragile regions (sloping terrain, forestry reserves). This rapid migratory phenomenon stresses the necessity of stricter control of such migrations in the near future, by providing for the protection of the ecologically fragile zones and the regulation of spontaneous population movements.

Pedo-climatic Conditions

The high-altitude region has very favourable pedo-climatic conditions for the cultivation of coffee. The soils are not over-used and remain fertile longer, since the temperature drops 0.6 degrees in 100 metres (average 27 degree at sea level). Heavy rains, which are more regularly distributed than in the rest of the province, are well-suited to coffee. They nevertheless hinder its commercialization (Tab. 39).

Table 39 Environment and coffee farming methods

	Bukit Barisan mountains	Foothills and peneplains
Infrastructure	not developed	developed
Farmers' isolation	severe	not marked
Demographic pressure	limited	high
Pedo-climatic conditions	relatively poor	mod. favour.
Type of agriculture	commercial	commercial
Type of commerce	regular, active	regular, active
Coffee farming	extensive	extensive

Source: ORSTOM field surveys, 1987.

Unfortunately, the extensive shifting cultivation methods do not compensate for the soil's loss in nutrients by correct fertilization and are still prevelant in the zones with expanding the population. Moreover, soils which are increasingly less fertile are being placed under crops as more forests are cleared. These two factors rapidly decrease the yields.

Infrastructures

Whereas the older coffee region, located on the foothills east of Bukit Barisan, is relatively well serviced, the newer regions that have been producing for 10 years, are particularly isolated. Transporting the coffee from the plantations around the upland villages can only be done on foot or by motorcycle due to the conditions of the roads and the often long distances that must be covered. It takes an average of 2 hours to transport coffee by motorcycle from the plantation to the seat of the *kecamatan* (50 km).

The Ministry of Public Works was not able to keep up with the rapid population growth in this region in terms of funding. Thus the population sometimes unites to organize its own lines of communication with the other zones. In this manner, in 1987, 10,000 planters' families in the Sekincau region hired a private company from Jakarta to enlarge the access road to their villages in order to allow 4-wheel drive vehicles to cover 40 more kilometer. The cost, extimated at Rp 500,000,000, correspondents to 250 kg of coffee per family at present market prices.

The provincial road from Liwa to Bukit Kemuning allows the coffee grown in Lampung *Utara* (nearly 40,000 t/year) to be transported to market. Its condition has considerably worsened during the past few years, and it takes 4 hours (in the dry season) to cover the 90 km between Liwa and Bukit Kemuning. Repairing it appears indispensable in the very near future, because some places could be cut off in the next rainy season.

Once the "Trans-sumatra" road has been reached, transport is no longer a major problem, since the 130 km from Bukit Kemuning to Teluk Betung can be covered in 3 hours.

Technical Level, Formation

The technical level, the yields, and the quality of the coffee are generally low, for several reasons:

Transformation

Each step in the processing of coffee lowers its quality. Through lack of labour at harvest time, "strip picking" remains frequent. The grains on the same branch are all picked at one time, whether or not they are all mature. Drying in the upland villages is done in poor conditions. The coffee is dried directly on the ground or on mats and gets wet every time it rains. The isolated villages have no shelling machines and process their coffee with wooden shelling tools, which considerably increase the percentage of broken grains.

The merchants' responsibility must also be taken into consideration. They often confuse the difference between homogenizing the quantity and adding poor quality coffee in order to increase their incomes. Finally, from a mediocre raw product, the exporters make a majority of 3-4-grade coffees (official ICO standards), since more intensive treatment bringing the quality to 1-2 Grade is not profitable.

There has nevertheless been definite progress over the past 10 years, when the quality of Lampung's exports correspondend to the present grades n° 5-6.

Storage

The decision to store depends on the amount of capital available. This is why it is done mainly in Teluk Betung by the exporters and the *pedagang lokal*, or regional collectors.

When they can, the planters stock part of their harvest, which acts as a savings account, compensating for the absence of a banking system in their villages. This practice is not advantageous for them, because the prices they can obtain on sales of small quantities are much lower than those for larger transactions.

Quality of the Coffee

The variety planted by the majority of the farmers in Lampung today is Robusta, with a less favourable return for quality than Arabica. In the mountainous regions, 80 kg of EK I coffee (export grade 3-4) can be obtained from 100 kg of market coffee. In the plain, this figure drops to 50 kg.

But the world market over-production (Indonesia manages to export only two-thirds of its production and its average consumption is still low, 0.5 kg per year and per inhabitant as opposed to 4 to 5 in the industrialized countries), and the absence of a system of payment based on quality, prevent the production of good coffee.

To the planters' careless post-harvest practices are added those of the merchants, in a very competitive collecting market. Thus the lesser quality grains left after selection of the export coffee are sold to the local torrefaction firms or sent back to the major markets (Kotabumi, Prinsewu, Wonosobo, Bukit Kemuning) to be combined with the local production.

At the level of the *kecamatan*, the merchants' use of humidity gauges is spreading and sample testing in order to determine the % of bad grains is sometimes carried out during large sales. In Teluk Betung, the international system of quality control is now widespread, and the number of defects per 300-gram sample is noted according to an internationally-accepted quality scale.

The *PPMB*, who undertook the controlling of the coffee exports in 1979, has

taken actions that have contributed to the change in attitudes within the sector. Unfortunately, this change has not yet touched the levels of production and collecting.

Information

Despite a few rare exceptions (planters who listen to the news every morning at 5:30 on the BBC when the coffee prices on the London stock exchange are given), the information available to the planters is limited. The absence of standards for the transactions contributes heavily to this. The closed nature of the market maintained by the collectors disadvantages the planter, since the price of coffee can easily be lowered in over-estimating the % of humidity, broken grains, or poor colour.

The situation is quite the opposite at the commercial level of the sector. A certain number of exporters or *pedagang lokal* are now keeping their collectors in the *kecamatan* informed through radio contacts, on the decreases in world prices. The local patrons have set up a system of CB radios or walkie-talkies that allows them to rapidly transmit the information provided by the boss in Teluk Betung to their *anak buah*, or agents. In one hour, all the small village merchants have been informed of the variations in the world market.

Financing

In Lampung, there is at present no *KUD* or farm organization which commercializes its own production. But, the Indonesian authorities, working with the coffee exporters, have implemented several attempts to correct this deficiency.

For instance groupe sales took place in 1981, in the Kasui region (see the paragraph concerning the financing of the coffee production, page 65). About thirty *kelompok tani* had already been successfully implanted. Following the establishment of privileged contracts through the provincial agents of the Directorate General of Estates and the *AEKI*, one exporter decided to set up a contract with a *KUD*, created to this end by regrouping several *kelompok tani* in the *kecamatan*. The *AEKI* itself increased its efforts in the formation of the producers. But this experiment was stopped by the exporter in 1983 due to the failure of the *KUD* to reimburse a credit initially accorded after the producers stopped selling to the *KUD*. This failure was due to the following causes:

- the fact that the directors were unable to manage the organization, as they had never had experience in administrating structures of this size; and
- a problem of funding. The exporter's funds were loaned at the outset to allow the farmers to be paid in cash, but were invested in other operations, which made it impossible to pay cash. The farmers lost confidence, and turned to their usual merchants, though they continued to work together as they had in the *KUD*.

KUDs or PMUs which are considering the possibility of developing group sales, should take this experiment into consideration.

The Economy of the Sector

Prices

Many factors can explain the farmers' difficulties in obtaining prices in relation to the world market prices.

More so than for rice or cassava, the lack of openess in the market, which is maintained by the absence of precise quality standards for the planters, creates a lowering of the farm prices.

If the variations in the world prices are rapidly known in terms of decreases, the increases are not known for several days. But, as the competition in the supply sector of the international marketplace has increased with the production of coffee, the delays are much shorter than they were ten years ago. For the same reason, speculative storage is no longer done as intensely as it was at the end of the 1970s, especially since the price tendencies in 1986 and 1987 were decreasing. With the probable drop in the Brazilian production of Robusta (the flowering is presently taking place in unsuitable conditions), it is certain that in the next few months this activity will be stimulated.

The planters' attitudes also play an important role. Selling their production at the last moment and in small quantities, they obtain prices that are much lower than those on the market at the time.

Finally, the poor quality of the coffee grown by the planters and the prevailing transportation problems remain the major causes for their relatively limited share of the final consumer's price (see table 58, page 90).

Development of the Sector

In the present situation of worldwide over-production, in which increases in prices can be credited to the climatic accidents in Brazil, the measures that could increase the planters' incomes concern the improvement of the road networks, plus improvements in the quality and commercialization of their produce by the farmers themselves.

Improving the road networks

The shipping costs from the producing regions to Teluk Betung average Rp 250/kg, whereas they would average Rp 30/kg for the same distance on a asphalt road. The Dutch had built two trails, which can be used today only by motorcycle, that connected the Wonosobo region to Liwa and Sekincau (85 km). These roads, are paved with stones for a very short, badly-repaired distance and then become dirt. They are now forbidden to 4-wheeled vehicles as they would never withstand the passage of the numerous trucks during the harvest. Repairing and asphalting them seems possible, at a cost that would probably be less than the model presented in Table 40.

Table 40 Cost and benefits from road construction in isolated regions

Present freight cost by motorcycle	Rp 250/kg
Freight cost after road constuction	Rp 30/kg
Gross gain per kg of coffee	Rp 220/kg
Road building cost: (50 km asphalt road a rp 60 millions/km)	Rp 3 milliards
Annual costs: 10 years amortizing 5% maintenance cost	Rp 450 millions
Annual cost per kg of coffee	Rp 90/kg
Net gain per kg of coffee	Rp 130/kg

Source: Orstom field surveys, 1987.

Improving the quality

To raise the low level of quality of the Lampung coffee involves measures which concern the sector as a whole. The continuity of the positive effort of the *PPMB* in terms of supervising the exports and remunerating the small collectors for the quality of their supplies to the exporters by using a price scale, should be actively encouraged by the Indonesia authorities and the *AEKI*.

It is above all, with a view to helping the farmers that the improvements in post harvest practices should be encouraged, supported by small credits for investment in processing material (raised drying floors with movable roofs, coffee, shelling machines etc.). If such aid is presently furnished by the authorities and the *AEKI*, as donations, it often remain unused because it does not have the production capacity required by the *kelompok tani* for which it is destined, and it rapidly deteriorates from lack of spare parts or technical competence for maintenance. In this manner, the *DPK* (Directorate General of Estates) distributed 120 shelling units to the *kelompok tani* of the province in 1987, whose yearly capacity suffices for 5 farmers per group. Moreover, the *AEKI* donated, to the *kelompok tani* of Kasui in 1981, an oven for drying coffee beans, which allows the grains to be dried in 24 hours instead of 15 days. Unfortunately, the operating costs are too high (the oven burns wood) and the yearly processing capacity is 25 t/year, while the *Kelompok Tani* produces 500 t/year.

Commercialization aid from the farmers themselves

As with rice and cassava, new forms of contracts between farmers, transporters, and merchants allowed for a better distribution of incomes within the sector and increased the farmers' incomes (payment in advance or in cash by the buyers, supply contracts guaranteeing a regular supply from the farmers to the merchants, and consideration for quality according to the present international standards).

This implies the creation of an adequate structure for the farmers, because the fundamental problem in the coffee sector remains the farmers' management. The PMU system seems better-adapted than the *KUD*, to develop the production and commercialization of plantation crops in general and coffee in particular. The responsibility for the project has in fact been given to persons within the department itself, in the production zone, who have the necessary technical and economic competence. The directors of the PMU can provide guidance on the crop while helping the farmers to progressively create communities (through *kelompok tani*, then *KUD*), by first taking care of the technical problems, then the supply and finally commercialization and investment.

Appendices

Appendix I

Transmigration in Indonesia

With 168 million inhabitants as at the end of 1986, Indonesia ranks fifth in world population. Nearly 70% of the inhabitants live on Java, though this island only accounts for 7% of the total surface area of the country. Of the 20 million Javanese households, 17 million live in rural areas and 11,6 million raise food crops, on a total area of nearly 6 million hectares.

The standard of living for this farm population is quite low. In 1984, whereas 63% of the families owned less than 0,5 hectares per family, the average income per household came to US$ 700 per year. Two-fifths of the households live below the poverty level, established for Indonesia by the World Bank in 1984 at US$ 540.

Demographic pressure has become such that the landless farmers have begun to cultivate increasingly fragile land such as sloping terrain or forestry reserves, despite the risk of compounding Java's ecological imbalance.

In the resettlement zones, the farmers' standard of living is higher, though the soil quality is often inferior to that on Java. Household income averages US$ 1,000 per year. The amount of land owned by each farmer remains limited, but the percentage of families farming less than 0.5 hectare has dropped to 25%.

Out of these differences between the situation on Java and in the Outer Provinces, has come the policy of government-assisted transmigration. This voluntary programme attracts disadvantaged farmers who have decided to move in order to improve their lifestyle and their children's future. Applicants for transmigration are usually landless farm workers. Today, the programme is carried out almost entirely on a voluntary basis, with the exception of the resettlement of whole villages necessitated by natural catastrophes or large-scale development projects (irrigation networks, hydro-electric dams, etc.).

The extent of the efforts, both governmental and individual, has made transmigration the largest government-assisted voluntary migration programme in the world today (Tab. 41).

Table 41 Sponsored transmigration programme, 1950-1986

Year of arrival	REPELITA	Total pop. moved
1950/1954		87,000
1955/1959		134,000
1960/1964		111,000
1965/1969		92,000
1969/1974	I	176,000
1974/1979	II	228,000
1979/1984	III	1,492,000
1984/1986 (may)	IV	154,000
Total		2,474.000

Source: Official summary of transmigration programme, MOT, 1987.

The Role of Transmigration in the Development of Indonesia

The two main keys to development in Indonesia are to increase the number of employment possibilities and decrease the amount of poverty. To this end, transmigration is one of the solutions that has been implemented. Given these two major governmental objectives, this programme is designed to influence the following sectors:

- **Demography**: by reducing population growth on Java and thus the risk of a massive rural exodus;
- **Job creation**: by providing landless Javanese farmers with 2 hectares for their crops, as well as lessening the pressure on the job market on Java and creating permanent employment in the resettlement zones;
- **Ecology**: by reducing the environmental damage that has reached a critical limit on Java for the population as a whole; and
- **National Unification**: by progressively integrating, through the benefits provided by transmigration programmes (dispensaries, schools, road networks, agricultural extension services, market organization, financial services, etc.) the local populations who are occasionally quite backward with respect to the Indonesian economy (as in Irian Jaya) Tab. 42.

Table 42 Impacts and perspectives of Transmigration policy

Objectives	Results and perspectives
Demography	1. 366.000 families resettled between 1979 and 1984 2. For every government assisted family, 2.5 families emigrate spontaneously 3. Official transmigrants (4%) and spontaneous transmigrants (9%) represent 13% of the total population of the host regions 4. Resettlement objectives reduced to 100-150.000 families per REPELITA, until 1999, when the program will end 5. Demographic effect in 2020: 15 million more inhabitants in the outer provinces. Population (millions) JAVA OUTER TOTAL without transmigration 169 107 276 with transmigration 154 122 276
Employment	1. 500-600.000 jobs created during REPELITA III at a cost of USS 4.000 job created. 2. Objective: conserve the jobs created and reorient second stage development of RCFC and IRTF sites to the use of labour intensive methods.
Regional development	1. In the underpopulated regions, the development funds contributed by the MOT represent 40 to 50% of the local development budget. 2. 26.000 km of roads built under transmigration from 1979 to 1984; to wit, 20% of the total road network in the host regions. 3. 1.200.000 tons of rice produced by the transmigrants; to wit, 17% of the production of the Outer Provinces. 4. Objectives: conservation of economic activity; development of infrastructures and services in the host regions.

Table 42 Impacts and perspectives of Transmigration policy (Continued)

Objectives	Results and perspectives
Ecological	1. Decreased risks on Java (soil erosion, siltation of irrigation reservoirs, deforestation, etc.) 2. Objective: channeling spontaneous migration and improving the rural development of the host regions (the installation of 800.000 families between 1988 and 1999 will necessitate the clearing of nearly 1,400.000 ha of forest, to wit 1.5% of the total forest area).
National unity	1. At the regional level, the migrants do not constitute more than 8% of the total population. 2. At the district level there is a more noticeable imbalance: - transmigrants make up more than 25% of the total population in 2 *kabupaten* (Lampung and Sumatra *Selatan*) - 33% of the migrants are located within 9 of the 66 host *kabupaten*. 3. The problem will have to be handled carefully in Irian Jaya.
Decreasing poverty	1. The transmigrants' standard of living is still low, as the migrants were among the poorest on Java before their departure. Yearly income USS/family: AVg. %<330 %<545 %>545 Transmigration 636 20 50 30 Region of origin 733 15 45 40 Host region 990 5 25 70 2. Two-thirds of the transmigrants surveyed said they were satisfied with the improvement in their standard of living (one-sixth were dissatisfied). 3. The objective today is to improve the existing transmigration centres using the SP/NES and SP/PMU models, to allow the transmigrants to progress out of subsistance farming.

Source: Ministry of Transmigration, 1986.

The Governmental Installation Programme

Examples of Agricultural Exploitation Supporting Transmigration

Though they have been modified several times since 1905, transmigration's general directives have retained three common denominators. First, they always concern small farms. Second, the transmigrants receive government aid without which they could not hope to succeed in the resettlement zones. Free transportation to the site, destined to become a true village after five years; the donation of two hectares of land of which one has been cleared and is ready to farm; a house; all farming equipment and food furnished free of charge of the first year on the site: these advantages have all been provided to the majority of programmes. Finally, the transmigrants are recruited according to strict criteria, which is essential to the success of the program. Transmigration is limited to married couples from the rural zones of Java, Madura,

Bali or Lombok, who have agricultural experience (small-scale land-owners or farm labourers).

On the other hand, there have been a considerable number of changes in the type of agricultural exploitation on which the transmigrations have been installed.

From 1905 to 1970, irrigated rice farming provided the basis for transmigration. In the projects of the 1960's, the farmers received land destined for irrigation. Unfortunately, the cost of such installations, which was quite high in view of the Indonesian financial resources of that period, led to a great many setbacks in the construction of the irrigation networks and resulted in very precarious living conditions at the centres. Therefore, other types of farms were studied and developed so that a transmigration policy could be carried out on a larger basis.

Beginning in 1967, a variation of the typical method of irrigation was developed in the swampy coastal regions of Sumatra and Kalimantan. In these regions, the tidal bore phenomenon pushes rivers to be flooded. Since 1967,670,000 ha of coastal swampland irrigated in this manner have been developed and, during *REPELITA III* (Third 5-Year Development Plan: 1979-1984), were resettled by 67,000 families. This figure represents 18% of the total number of families resettled during this same period according to the model "Irrigated Rice-farming by Tidal Flow" (IRTF).

Most of the 228,000 transmigrants installed between 1970 and 1975 were given 1 or 2 hectares that allowed for the rainfed cultivation of food crops (RCFC model, a combination of rice, maize, and cassava on the same fields). But it was only during *REPELITA II* (1974-1979) that the increase in national production, to which were added regular rice shortages, led to the extension of this type of exploitation based on subsistence farming. Nearly 80% of the 366.000 families who transmigrated during *REPELITA III* were resettled according to this model. They received, free of charge, 2 to 5 hectares of land of which 1.25 ha was ready to be farmed, as well as the seed, fertilizers and phytosanitary products necessary for the first three years at the site.

The Results of the Transmigration Policy

REPELITA III, or the Implementation Phase of the Programme

While *REPELITA III* was in its planning stage, the authorities saw the acceleration of the transmigration programme as a means of improving the conditions of the poor and protecting the fragile zones on Java, and also of developing the Outer Provinces and increasing agricultural production.

The government proposed to install 500,000 families over 250 centers of 5000 hectares each between 1979 and 1984. The programme was launched on a large scale, at a time when Indonesia was still the world's largest importer of rice. Therefore, the type of exploitation chosen was that of "Rainfed Cultivation of Food Crops" (RCFC), which had been tested during the preceding period and had proved more rapid and less costly to carry out than the other solutions (Tab. 43).

The results of *REPELITA III* speak for themselves. The level of governmental transmigration rose from 52,000 families during *REPELITA II* to 366,000 families between 1979 and 1984. Nearly 80% of these families were resettled according to the RCFC model; 18% were installed according to the IRTF model, and only 2% according to the "Small Plantation" (SP) model. The total cost of the programme

during *REPELITA III* is estimated at Rp. 2,300 billion; to wit, US$ 6,285 per family.

But at the same time, the rapid acceleration of the programme also created many new problems. The selection of the sites, their preparation (clearing, levelling, filling in swamps) building roads and houses and bringing in the farming equipment and food provisions, were occasionally haphazardly done due to limited means or lack of co-ordination between the Ministries involved.

Table 43 Transmigrant families moved during REPELITA III

Transmigrants	1979/1980	1980/1981	1981/1982	1982/1983	1983/1984	Total
Assisted by GOI (1)	21,093	73,203	84,456	92,784	94,381	365,917
Sumatra	16,384	49,043	48,520	57,578	55,540	227,065
Kalimantan	565	11,976	17,378	17,448	23,207	70,574
Sulawesi	3,854	9,663	15,890	12,396	9,879	51,682
Irian Jaya	290	2,521	2,668	5,362	5,755	16,596
Spontaneous migrants (2)	1,985	3,359	8,961	32,445	122,747	169,497
Total per year (1) + (2)	23,078	76,562	93,417	125,229	217,128	535,414

Source: MOT, 1985.

The private national plantations began to be associated with transmigration in 1978, through the SP/NES (Small Plantation/ Nucleus Estate) projects. These projects provide funding to existing plantations, enabling them to increase in size by planting, for the most part, by transmigrants and to a limited extent by local farmers who wish to join the project.

Though the installation costs of this model are greater than those of the preceding ones, part of the costs can be covered since the transmigrants participate in financing the project (to the amount of US$ 800 to 1,200) by contracting a loan. In fact, the higher income level of the farmers under the (SP) model allows their participation in the financing of the project to be considered. The NES projects concern rubber, oil palm, and hybrid coconut plantations (Tab. 44).

Table 44 Estimated installation cost per transmigrant family in 1984 (US$)

Type of farm	Model RCFC	Model IRTF	SP/NES (Rubber)
Site selection	466	466	0
Site preparation	2,201	3,795	3,746
Selection and recruiting	1,673	1,963	1,184
Agricultural development	278	278	1,909
Administration	692	976	1,907
Total Costs	5,310	7,480	7,396

Source: Ministry of Transmigration, 1986.

A related SP model, SP/PMU (Project Management Unit, or *Unit Pelaksana Proyek*), is attracting more and more interest today, with the improvement of the existing sites. The transmigrant himself takes charge of preparing the land and

planting. He receives credit in the form of production means, which allow him to cover the investments made in the first years, while the plantation is not yet in production. The PMU provides technical assistance to the project and educates the farmers in the running of a plantation, which they are often undertaking for the very first time.

The Strategy of Transmigration Today

Budget Cuts for *REPELITA IV* Re-orient the Programme

Still, within consideration of the objective of decreasing unemployment, the resettlement ceiling proposed during the elaboration of the fourth five-year plan remained high. The initial objectives were planned for the assisted migration of 425,000 families. Out of this total, 32,000 families were to be resettled according to the RCFC model and 110,000 according to the SP model.

The gradual acceptance by the MOT authorities of the SP model, more costly in installation, results from the conjunction of several factors. The success of the "Green Revolution" (a surplus of rice was recorded by 1982), as well as the recognition of the difficulties that the transmigrants installed under *REPELITA II* and *III* had, in raising their standard of living with the RCFC model, made it necessary to re-orient the models of the exploitation systems used (Tab. 45).

Table 45 Transmigrants' perception of living conditions compared to their former location

	REPELITA II	REPELITA III	Total
Better	66%	67%	67%
Same	17%	19%	17%
Worse	23%	14%	16%
Sample size	540	1598	2138

Source: Transmigration income survey, BPS, 1985.

But, since the beginning of *REPELITA IV*, new problems have appeared alongside the former ones for which solutions are being found. The sites are located in regions that are increasingly farther-removed, which causes numerous delays in both the preparation and the supplying of the transmigration centre. Despite this, the objectives of the plan have been respected. Nearly 154,000 families received government aid between April 1984 and May 1986 (Tab. 46).

Table 46 Transmigration during REPELITA IV (till 31.5.86)

Transmigrants	Assisted	Partly assisted	Spontaneous	Total
Sumatra	78,511	5,905	104,544	188,960
Kalimantan	34,083	4,225	33,714	72,022
Sulawesi	21,777	2,055	8,478	32,310
Irian Jaya	7,399	36	2,675	10,110
Total	141,770	12,221	149,411	303,402

Source: MOT, 1986.

Since December 1985, the oil crisis has proved to be a greater handicap to the rapidity and organization of the programme than the new problems encountered. With respect to the 1985-1986 budgetary year, the MOT's development budget was decreased by 22% in 1986-1987, whereas the funds needed for maintenance and rehabilitation of the sites are increasing. The objectives have been revised and called for a total of 36,000 families to be resettled in 1986-1987 (initial objective of the plan: 85.000 families resettled per year).

In the long run, the chances that oil prices will rise remain doubtful. Rather than continuing the policy of large-scale resettlement, the MOT is now concentrating on improving the existing sites in order to retain the benefits of nearly 82 years of active transmigration policy. The main points of the programme on which the efforts are based today are:

- rehabilitating the RCFC and IRTF sites and implementing the second stage of their development, via the installation of rubber, oil palm, and hybrid coconut plantations under the SP/NES or SP/PMU systems, so that the transmigrants can surpass the subsistence-farming level;
- maintaining the infrastructures set up under REPELITA III (roads, bridges, buildings, etc.) that link the transmigration centres to the new economic activity of the host regions, which is one of the primary conditions for increasing trade between the centres and the host region;
- implementing a true policy concerning the spontaneous migrants, which will allow such un-aided migrations to have increased chances for success and to be more effectively channeled to the host regions. It is now estimated that for every government-assisted transmigrant family, 2.5 families migrate spontaneously to the same host regions. This ratio will decrease as the distances between the zones of origin and the host zones increase. Jayapura, the provincial capitol of Irian Jaya, is more than 3750 km from Jakarta, whereas the Lampung sites are not more than 500 km from Jakarta. Measures facilitating land ownership for spontaneous migrants should be considered in order to continue this movement under the proper conditions;
- defining a policy for ecology and the preservation of natural and forestry resources in the host regions. Channelling spontaneous migrations is one of the measures taken in this objective, which will allow, in the long term, for the ecological balance of the concerned regions to be preserved;
- inducing the local populations in to the transmigration programmes, because these programmes have heavy consequences on regional population balances. In order to provide equal opportunities for all, special attention should be given to integrating the marginal ethnic groups (for example the Papuan tribes in Irian Jaya) into the social and economic development of the region); and
- facilitating intervention by the private sector (industrial groups requiring labour, private plantations, etc.) in the transmigration process. Steps taken in this area would allow the transmigrants to increase their income while at the same time accelerating the economic development of the Outer Provinces.

Appendix II

Marketing the Transmigrants' Farm Products

Production

Some 400,000 persons living in Lampung *Utara* could be considered "transmigrants" at the end of 1987:

- 200,000 were government MOT-assisted transmigrants
- 200,000 were aided by the provincial government for their intra-provincial migration.

The majority of these farmers were resettled according to the agricultural exploitation model RCFC. The environment is particularly unfavourable to the development of commercial agriculture, and subsistence and food self-sufficiency remain the primary objectives of the farmers in these recently-colonized zones.

Pedo-Climatic Conditions

The majority of the transmigration centres installed in Lampung *Utara* since 1980 are located in the large eastern peneplain where the pedo-climatic conditions are unfavourable for many of the food crops (rice, maize, soybean, fruits and vegetables.)

The length of the dry season (4 to 5 months) and the soils' characteristics (acid pH, large amounts of exchangeable aluminium, limited amounts of organic matter) make the farmers' subsistence difficult (see Tables 20 and 21, page 25). A second yearly crop is impossible in the present conditions. Some crops are more resistent (particularly cassava, rubber, oil palm, and coconut), and these could prove successful for the most disadvantaged transmigration centres (Tab. 47).

Table 47 Environment of transmigration centres

Road infrastructure	very limited
Farmers' isolation	critical
Demographic pressure	moderate to low
Pedo-climatic conditions	unfavourable for many crops
Type of agriculture	food-crops
Type of commerce	occasional
Principal crops	cassava, maize, rice

Source: Orstom field surveys, 1987.

Infrastructures

In Lampung *Utara*, the most recent transmigration centres have no asphalt roads, as the asphalted section stops at Menggala, in the southern part of the *kabupaten*. Thus access to the sites becomes a very great problem during the rainy season, in other words, 7 months of the year.

Providing access routes to this region could be done by building a 250-km asphalt road directly from Menggala and the south of the province to Palembang. This would be very costly (necessitating about Rp. 150,000.000/km or USS 22.8 millions for the total distance). In terms of cost per transmigrant. this only represents USS 130/family, considering as sole beneficiaries the 95.000-odd families living in Lampung *Utara* and the same number who live north of Wiralaga between Way Mesuji and Palembang.

Technical Level, Formation

The technical level and the yields are generally low, for several reasons:

- the isolation makes it difficult to set up and manage training programmes, which are moreover placed in the hands of young, unskilled personnel.
- once the MOT aid is stopped. supplies of production materials become more irregular and expensive, as the costs and risks of transport increase the prices of fertilizers and phyto-sanitary products; and
- the potential yields are low. After two years of relative fertility, the yields in rice and maize drop drastically (loss in soil organic matter, infestations of pests, etc.). By the third year, cassava is the only crop that ensures the farmers' food. By the end of the fifth year, the transmigrants welfare is placed under the responsibility of the regional authorities, just when the cassava yields begin to drop.

Thus. the farmers rapidly adopt traditional forms of agriculture, which require little labour or money, and seek other sources of income in off-farm activities (Tabl. 48).

Table 48 Average monthly household income by type of transmigrant

	Total income	Agric. income	Wages Pension	Other income
Type of movement				
assisted	54,000	19.000	22,000	13,000
spontaneous	67.000	24.000	27,000	16,000
retired ABRI	117,000	16.000	92,000	9,000
Area of origin				
Java	55.000	18.000	24.000	13,000
Bali	61.000	18.000	24,000	19,000
Education level				
none	51.000	19.000	20.000	12,000
less than primary	54.000	17,000	23,000	14,000
primary	74,000	20.000	27,000	27,000
junior high school	70.000	15.000	40,000	15,000
high school	77.000	19.000	42.000	16,000
Age of household head				
<20 years	52.000	12.000	26.000	14,000
21 – 25 years	53.000	17.000	23,000	13,000
26 – 30 years	56.000	17.000	23,000	16,000
31 – 35 years	56.000	18.000	26,000	12,000
>35 years	61.000	20.000	27,000	14,000

Source: Transmigration income survey. BPS. 1985.

Financing

During *REPELITA III*, the Indonesian government concentrated on a policy of large-scale resettlement and delayed until the following five-year plans the development of commercial agriculture based on the plantation model that would help increase the transmigrants' standard of living. Two main structures allowed for the financing of this project, the NES and PMU systems (rubber, oil palm, and hybrid coconut palm).

The PMU financing methods seem to be the best adapted to the transmigration centres in Lampung *Utara*, for rubber and hybrid coconut palm. Indeed, this organization handles itself, under contract with the farmers, the installation of plantations and the setting up of the crops, while centralizing numerous facilities on the site: credit, supplies of production materials, training courses and farm counselling.

The PMU's official extension in formation and financing for other crops, especially food crops, could allow for progressive intensification of crops such as rice, maize, and cassava, which would better ensure the transmigrants' food self-sufficiency. This would be a way to balance the migrants' agriculture, between the subsistence farming necessary to cushion any eventual drop on the international market for plantation crops, and the increase in incomes through the organization of commercial agriculture.

Marketing

Transport

This is a determining and unavoidable expense for the transmigrants. The lack of asphalt or stone-paved roads in the transmigration zones increases the risks of transporting the goods and makes the farmers quite vulnerable to the shipping companies' or merchants' demands.

Improving the transport conditions for the farmers by creating new types of contracts between transporters and farmers and developing the infrastructures, is absolutely necessary and should be included in the NES and PMU systems.

Transformation

Due to the lack of financial means or structures allowing for economies of scale, processing the agricultural products on the sites is still done in a traditional manner and only for village use.

Should there be a marketable surplus, the transmigrant sells his crops either raw (paddy, fresh cassava, unhusked maize) or processed (rubber, copra). Quality is not a primary consideration. Indeed, there is no system that could encourage an increase in the added value for quality goods.

Technical aid from the PMU can stop this vicious cycle, by facilitating village processing and improving the methods used, which are particularly harmful for the plantation crops.

Storage

The storage conditions on the farm are precarious. Storage is done mainly to preserve the food crops for the farmers' needs throughout the year.

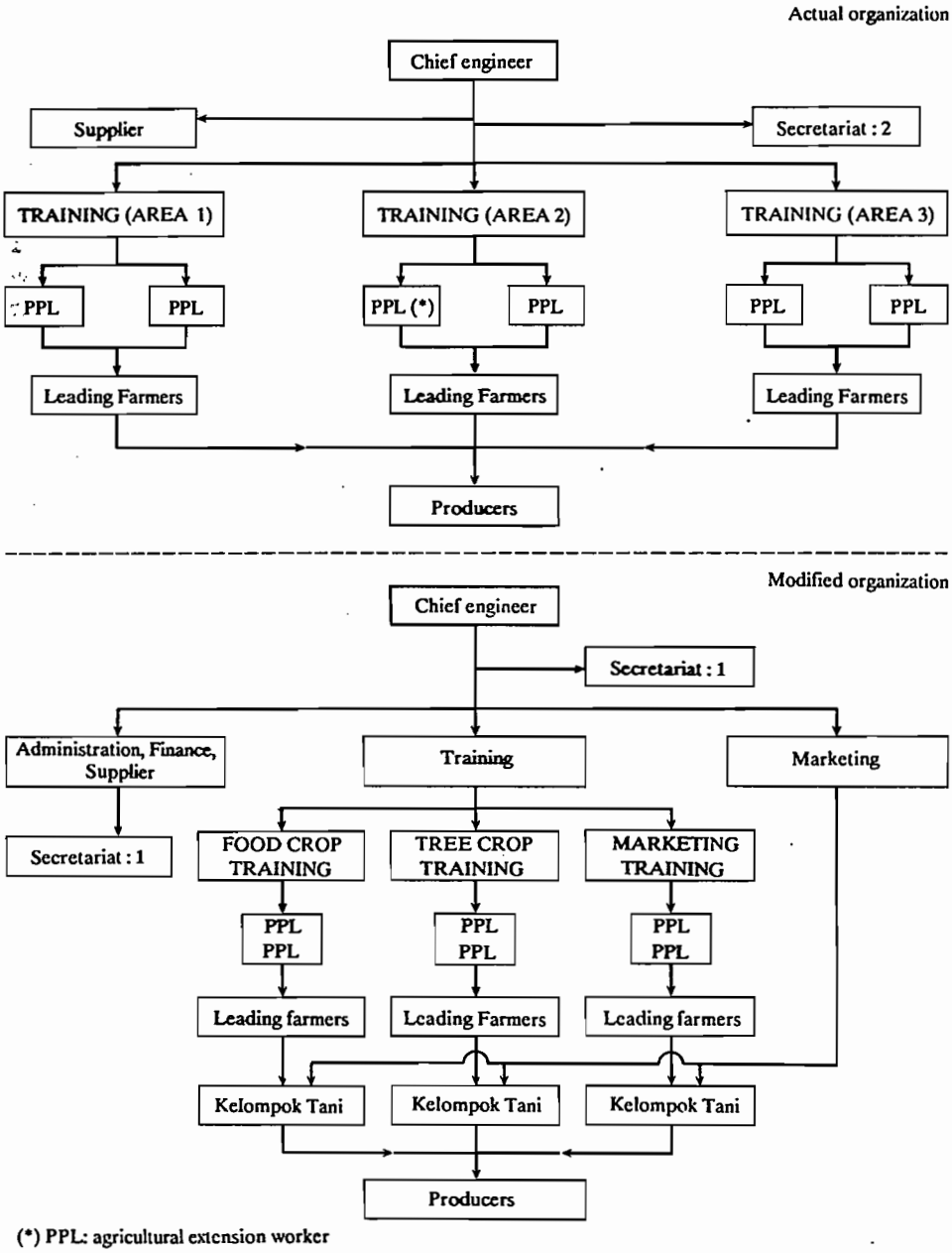

Figure 20 Modification of PMU's structure, related to new objectives (food crop and marketing intensification).

Quality of the Farm Products

As in the other sectors studied, there is no price scale according to the quality of the supplies, and the absence of such a system makes any commercial aid programme useless. The PMU programmes could provide the opportunity to set up such measures, which are necessary to their acceptance by the farmers.

Information

Quite backwards with respect to the regional economy, and reluctant to attempt to produce quality surplus crops, the transmigrants are among the least informed in terms of the markets. This position of inferiority is maintained by the transporters and merchants who, perhaps more than in other sectors, take advantage of the farmers' ignorance and isolation.

The farmers' lack of confidence in the transporters and the merchants is often justified, which, in return, inhibits any increase in production or quality of the products the farmers sell.

In most cases, the farmers do not need a great deal of information, and the same is required by all: firm prices, wholesale or export prices and their evolution throughout the year which affect the quality of the products sold. The PMU projects could take on the role of information centre and regulating the quality of merchandise the transmigrants sell.

Financing

Up to now, there have been few experiments in financial aid for commercialization in the transmigration centres. But some successful examples of PMU/Rehabilitation projects prove that such operations can be done. Several possibilities can be pointed out in terms of the destination of this aid:

- financing through bank loans of small enterprises (shelling, tapioca factories) who wish to install themselves in the transmigration centres. Such initiatives could be carried out in the host regions that are sufficiently developed to permit the local products to be easily sold.
- the progressive organization of the farmers oriented at first towards resolving problems of a purely technical nature, then supply, and finally marketing and investment. These could operate at first in small groups which would increase as the farmers' capacity to manage such structures improves.

The plantation crops, especially rubber, are well-adapted to the chronology of this type of approach. During the investment phase, when the plantation is not yet in production, the farmer can concentrate on resolving technical problems, which will then be mastered by the time the plantation begins producing. The PMU's action can then turn to the economic and social problems connected with setting up collective marketing structures.

The Economy of the Transmigration Centres

Prices

Whatever the international or national perspectives in terms of prices, improving the conditions of commercialization of the transmigrants' farm products is necessary to the success of the rehabilitation programme. Indeed, the transmigrants are actually on the fringe in terms of commercial and economic activities (Tab. 49). Even more than in the other sectors, the price variations are erratic and do not take the added value of the farm products into account.

Table 49 Average monthly household income by farm model and REPELITA

	Sample size	Food-crop income	Total agric. income	Wages pension	Other income	Total income
REPELITA II	540	13,000	22,000	15,000	23,000	60,000
Tidal	99	25,000	33,000	16,000	29,000	78,000
Upland	341	11,000	15,000	16,000	21,000	52,000
Plantation	100	8,000	33,000	9,000	25,000	67,000
REPELITA III	1,598	13,000	21,000	13,000	24,000	58,000
Tidal	501	10,000	16,000	5,000	19,000	40,000
Upland	977	15,000	23,000	15,000	28,000	66,000
Plantation	120	10,000	17,000	25,000	21,000	63,000

Source: Transmigration income survey, BPS, 1985.

Development of Marketing

The PMU Model

The development of the commercialization of the farm speculations acts directly on three of the transmigration objectives:

- improving the transmigrant's standard of living, based on an increase in marketable surplus and plantation crops;
- increasing the number of employment opportunities, created both in the farm and the services sectors.
- developing the regional economy, which has a secondary demographic impact (attraction of spontaneous migrants, retaining local population and the transmigrants).

It coincides with the methods and strategies presently employed in the programme, which is the rehabilitation of the centres installed according to the RCFC model, through the PMU/NES systems; maintaining the infrastructures and the economic tissue created in the course of *REPELITA III* and the increased intervention of the private sector.

- with respect to the classical structures (*KUD*) or to the NES programmes, the PMU seem to be best adapted to help the transmigrants generate surplus and then market it.

Extension of the PMU's Functions

Initially destined to set up and finance the secondary development of the smaller zones (1000 to 2000 ha) through the installation of cash crops, their functions could be profitably expanded to the intensification of food crops and the installation of collective structures for commercialization of all the transmigrants' products:

- by seeking and helping negotiate with commercial partners;
- by setting up new types of sales contracts with advance payment or cash payment and by seeing to it that farmers and merchants respect them (for example, an export contract for *gaplek* sold at 50% FOB);
- by managing, at least at the outset, the financial aid needed to operate the communities in the shape of overdraft authorizations, or village banks funded by a percentage of the sales from each farmer;
- by managing the credits for the development of integrated processing units:
- by supervising shipping with regular contracts between transporters and transmigrants; and
- by establishing and supplying the basic information needed by the farmers for their commercial transactions.

All these measures should be accompanied by a change in the present structure of the PMU (see Fig. 20, page 78). In the end, the objective is to allow the farmers to manage by themselves, the collective structures they set up. But the main constraint is still the human factor. If the responsibility of the PMU is to be given to experienced, capable persons, that of the communities will be handled by the farmers, who at first will not have much experience in this domain.

Appendix III

Marketing Costs for Rice, Cassava and Coffee

Table 50 Marketing cost of rice: Farmer-Wholesaler-Processing unit

Farmer	Selling price Rp 125/kg GKD)	(1) 210.67	(2) 56.9%
Wholesaler's agent	Searching commodity Rp 2/kg for 200 km transport)	3.44	0.9%
	Rice conveying (Rp 35/kg GKD)	60.20	16.3%
	Coolies for unloading	1.72	0.5%
	Total costs	65.36	17.7%
	Profit (Rp 5/kg GKD)	8.60	2.3%
	Selling price (Rp 167.5/kg)	288.07	77.9%
Wholesaler/Processor	Upkeeping working stock	2.13	0.6%
	Collecting costs	5.16	1.4%
	Drying costs	7.35	2.0%
	Workers' wages	2.86	0.8%
	Energy costs	3.00	0.8%
	Bagging	3.60	1.0%
	Amortization of working stock and equipment	5.71	1.5%
	Processing costs	29.81	8.1%
	Coolies: handling	2.00	0.5%
	Shed staff	2.00	0.5%
	Marketing costs	4.00	1.1%
	Total profit	18.12	4.9%
	Selling price	340.00	91.9%
Retailer	Case 1: lowlands		
	Conveying costs	5.00	1.4%
	Handling, stockpiling	5.00	1.4%
	Total costs	10.00	2.7%
	Profit	20.00	5.4%
	Selling price (lowlands)	370.00	100.0%

(1): Rp/kg of final product (white rice)
(2): % of consumer's price
GKD is *paddy* containing 19% moisture
Source: ORSTOM field surveys, 1987.

Table 51 Marketing cost of rice: Farmer-KUD-BULOG

Farmer	Selling price Rp 145/kg GKD)	(1) 249.50	(2) 59.7%
KUD and processor	KUD's cost	20.26	4.8%
	Conveying to huller (Rp 8/kg)	13.76	3.3%
	Staff KUD	1.50	0.4%
	Coolies: handling and weighing	2.00	0.5%
	Shed hiring	1.00	0.2%
	Administrative costs	2.00	0.5%
	Subconstracting costs (Hulling)	39.05	9.3%
	Upkeeping working stock	2.13	0.5%
	Drying costs	7.35	1.8%
	Workers' wages	2.86	0.7%
	Energy costs	3.00	0.7%
	Bagging	3.60	0.9%
	Amortization of working stock and equipment	5.71	1.4%
	Subcontractors profit	14.40	3.4%
	Polishing costs (50% of cases)	3.00	0.7%
	Polishing (Rp 1.5/kg)	1.50	0.4%
	Entry fee in DOLOG	1.00	0.2%
	Reconveying costs	3.50	0.8%
	Total costs	62.31	14.9%
	Total profit, to share between farmers, investment costs and various commissions	9.19	2.2%
	Selling price	313.00	74.9%
	(plus subsidized conveying)	8.00	1.9%
DOLOG	Stockpiling costs (US$ 45/t)	73.98	17.7%
	Admin. and financial costs	23.02	5.5%
	Gross margin of DOLOG	97.00	23.2%
	Selling price	418.00	100.0%

(1): Rp/kg of final product (white rice)
(2): % of consumer's price
GKD is *paddy* containing 19% moisture
Source: ORSTOM field surveys, 1987.

Table 52 Marketing cost of rice: Farmer-Factory-Wholesaler

		(1)	(2)
Farmer	Selling price Rp 145/kg GKD)	249.50	67.4%
Rice huller's agent	Profit (Rp 3.5/kg GKD)	6.02	1.6%
	Selling price (Rp 148.5/kg GKD)	255.52	69.1%
Processor	Unpkeeping working stock	2.13	0.6%
	Coolecting costs	5.16	1.4%
	Drying costs	7.35	2.0%
	Workers' wages	2.85	0.8%
	Energy costs	3.00	0.8%
	Bagging	3.60	1.0%
	Amortization of working stock and equipment	5.71	1.5%
	Total costs	29.81	8.1%
	Profit	29.67	8.0%
	Selling price	313.00	84.6%
Wholesaler (major town)	Conveying costs (150 km)	10.00	2.7%
	Coolies: handling	2.00	0.5%
	Shed staff	2.00	0.5%
	Total costs	14.00	3.8%
	Profit	13.00	3.5%
	Selling price	340.00	91.9%
Retailer	Case 1: lowlands		
	Conveying costs	5.00	1.4%
	Handling, stockpiling	5.00	1.4%
	Total costs	10.00	2.7%
	Profit	20.00	5.4%
	Selling price (lowlands)	370.00	100.0%
Retailer	Case 2: highlands		
	Conveying costs	200.00	54.1%
	Handling, stockpiling	10.00	2.7%
	Total costs	210.00	56.8%
	Profit	30.00	8.1%
	Selling price (lowlands)	580.00	156.8%

(1): Rp/kg of final product (white rice)
(2): % of consumer's price
GKD is *paddy* containing 19% moisture
Source: ORSTOM field surveys, 1987.

Table 53 Marketing cost of rice: Farmer stores and processes- Wholesaler

		(1)	(2)
Farmer	Selling price Rp 145 kg GKD)	249.50	67.4%
	Profit on stockpiling	20.00	5.1%
	Profit on marketing	7.55	1.9%
	Cost of *bawon* (10% paddy)	33.30	8.5%
	Stockpiling costs	16.63	4.3%
	Marketing costs	6.02	1.5%
	Total additional costs	55.95	14.3%
	Additional profit	27.55	7.1%
	Selling price	333.00	85.4%
Processor (sub-contracted by the farmer)	Upkeeping working stock	2.13	0.5%
	Collecting costs	5.16	1.3%
	Drying costs	7.35	1.9%
	Workers' wages	2.86	0.7%
	Energy costs	3.00	0.8%
	Bagging	0.36	0.1%
	Amortization of working stock and equipment	5.71	1.5%
	Total costs	26.57	6.8%
	Profit	6.73	1.7%
	Total *bawon* income (10%)	33.30	8.5%
Wholesaler (major town)	Conveying costs (150 km)	10.00	2.6%
	Coolies: handling	2.00	0.5%
	Shed staff	2.00	0.5%
	Total costs	14.00	3.6%
	Profit	13.00	3.3%
	Selling price	360.00	92.3%
Retailer	Case 1: lowlands		
	Conveying costs	5.00	1.3%
	Handling, stockpiling	5.00	1.3%
	Total costs	10.00	2.6%
	Profit	20.00	5.1%
	Selling price (lowlands)	390.00	100.0%

(1): Rp/kg of final product (white rice)
(2): % of consumer's price
GKD is *paddy* containing 19% moisture
Source: ORSTOM field surveys, 1987.

Table 54 Marketing cost of cassava: Farmer-Factory-Pellet Co-EEC

		(1)	(2)
Farmer	Selling price Rp 145/kg GKD)	130.00	52.8%
Factory's agent	Loading (Rp 1/kg tuber)	2.50	1.0%
	Conveying (Rp 4/kg tuber)	10.00	4.1%
	Total costs	12.50	5.1%
	Profit (Rp 3/kg tuber)	7.50	3.0%
	Selling price (Rp 60/kg)	150.00	60.9%
Gaplek factory	Purchasing cost (75% farmer)	135.00	54.8%
	Unloading, handling (Rp 1/kg)	2.50	1.0%
	Peeling tubers (Rp 2/kg)	5.00	2.0%
	Drying (wages)	0.38	0.2%
	Loading (Rp 1/kg *gaplek*)	1.10	0.4%
	Conveying to Teluk Betung	6.50	2.6%
	Total costs	15.38	6.2%
	Profit	4.62	
	Selling price (Rp 155/kg *gaplek*)	155.00	63.0%
Pelletizing company	Purchasing *gaplek* (85%)	131.75	53.5%
	Purchasing *ongkok* (15%)	12.00	4.9%
	Processing costs (pellets)	36.00	14.6%
	Administrative and FOB costs	10.00	4.1%
	Total costs	189.75	77.1%
	Profit	15.75	6.4%
	Selling price (US$ 125/t)	205.50	83.5%
EEC importer	Freight to Rotterman (US$ 22/t)	36.17	14.7%
	Insurance (0.5% Rotterdam CIF)	1.21	0.5%
	Total costs	37.38	15.2%
	Profit (US$ 2/t)	3.30	1.3%
	Selling price (US$ 149.20/t CIF Rotterdam)	246.18	100.0%

(1): Rp/kg of final product (pellet)
(2): % of consumer's price
Ongkok is the Indonesian name for the tapioca industry's residues.
Rp 1,644/US$ on October, 1st 1987.
Source: ORSTOM field surveys, 1987.

Table 55 Marketing cost of cassava: Farmer-Factory-Pellet Co-EEC isolated transmigration area, 600 km from Teluk Betung

Farmer	Selling price (Rp 34.6/kg fresh tuber)	(1) 86.50	(2) 35.1%
Factory's agent	Loading (Rp 1/kg tuber)	2.50	1.0%
	Conveying (Rp 4/kg tuber)	10.00	4.1%
	Total costs	12.50	5.1%
	Profit (Rp 3/kg tuber)	7.50	3.0%
	Selling price (Rp 46.2/kg)	106.50	43.3%
Gaplek factory	Purchasing cost (75% farmer)	91.50	37.2%
	Unloading, handling	2.50	1.0%
	Peeling tubers (Rp 2/kg)	5.00	2.0%
	Drying (wages)	0.38	0.2%
	Loading (Rp 1/kg *gaplek*)	1.10	0.4%
	Conveying to Teluk Betung	50.00	20.3%
	Total costs	58.88	23.9%
	Profit	4.62	
	Selling price (Rp 155/kg *gaplek*)	155.00	63.0%
Pelletizing company	Purchasing *gaplek* (85%)	131.75	53.5%
	Purchasing *ongkok* (15%)	12.00	4.9%
	Processing costs (pellets)	36.00	14.6%
	Administrative and FOB costs	10.00	4.1%
	Total costs	189.75	77.1%
	Profit	15.75	6.4%
	Selling price (USS 125/t)	205.50	83.5%
EEC importer	Freight to Rotterman (USS 22/t)	36.17	14.7%
	Insurance (0.5% Rotterdam CIF)	1.21	0.5%
	Total costs	37.38	15.2%
	Profit (USS 2/t)	3.30	1.3%
	Selling price (USS 149.20/t CIF Rotterdam)	246.18	100.0%

(1): Rp/kg of final product (pellet)
(2): % of consumer's price
Ongkok is the Indonesian name for the tapioca industry's residues.
Rp 1,644/US$ on October, 1st 1987.
Source: ORSTOM field surveys, 1987.

Table 56 Marketing cost of cassava: Farmer-KUD-Pellet Co-EEC isolated transmigration area, 600 km from Teluk Betung

		(1)	(2)
Farmer	Selling price (Rp 34.6/kg fresh tuber)	86.50	35.1%
	Additional profit to peeling, drying and handling *gaplek*	21.75	8.8%
	Selling price (Rp 44.4 kg)	108.25	44.0%
KUD *gaplek*	Conveying to KUD	2.00	0.8%
	Drying (wages)	0.50	0.2%
	Weighing and stockpiling	1.00	0.4%
	Loading (Rp 1 kg *gaplek*)	1.10	0.4%
	Conveying to Teluk Betung	35.00	14.2%
	Total costs	39.50	16.0%
	Profit	7.25	
	Selling price (Rp 155/kg *gaplek*)	155.00	63.0%
Pelletizing company	Purchasing *gaplek* (85%)	131.75	53.5%
	Purchasing *ongkok* (15%)	12.00	4.9%
	Processing costs (pellets)	36.00	14.6%
	Administrative and FOB costs	10.00	4.1%
	Total costs	189.75	77.1%
	Profit	15.75	6.4%
	Selling price (USS 125/t)	205.50	83.5%
EEC importer	Freight to Rotterman (USS 22 t)	36.17	14.7%
	Insurance (0.5% Rotterdam CIF)	1.21	0.5%
	Total costs	37.38	15.2%
	Profit (US$ 2/t)	3.30	1.3%
	Selling price (USS 149.20/t CIF Rotterdam)	246.18	100.0%

(1): Rp/kg of final product (pellet)
(2): % of consumer's price
Ongkok is the Indonesian name for the tapioca industry's residues.
Rp 1,644 US$ on October, 1st 1987.
Source: Orstom field surveys, 1987.

Table 57 Marketing cost of cassava: Farmer-Harvestman-Tapioca factory

Farmer	Selling price (Rp 36 kg fresh tuber)	(1) 180.00	(2) 52.0%
Harvestman	*Borong* or harvest (Rp 5/kg)	25.00	7.2%
	Loading (Rp 1 kg gaplek)	5.00	1.4%
	Conveying to factory (Rp 5/kg)	25.00	7.2%
	Total costs	55.00	15.9%
—	Profit (Rp 5/kg tuber)	25.00	7.2%
	Selling price (Rp 52/kg fresh)	260.00	75.1%
Tapioca factory	Handling	1.60	0.5%
	Weighing fresh tubers	1.50	0.4%
	Factory workers' wages	3.20	0.9%
	Drying of the flour (Rp 7/kg)	7.00	2.0%
	Drying *ongkok* (Rp 2.5/kg)	1.50	0.4%
	Amortization factory	10.00	2.9%
	Bagging	6.00	1.7%
	Conveying flour	7.00	2.0%
	Conveying *ongkok*	4.26	1.2%
	Dividends for factory owner	22.12	6.4%
	Total costs	42.06	12.1%
	Sources of income:		
	Tapioca quality A: 20% Rp 350/kg	70.00	25.2%
	Tapioca quality B: 30% Rp 300/kg	90.00	26.0%
	Tapioca quality C: 50% Rp 275/kg	137.50	39.7%
	Ongkok: 61% Rp 80/kg	48.80	14.1%
	Medium selling price	346.30	100.0%
	Profit	22.12	6.4%

(1): Rp/kg of final product (pellet)
(2): % of consumer's price
Ongkok is the Indonesian name for the tapioca industry's residues.
Source: ORSTOM field surveys, 1987.

Table 58 Marketing cost of highland export quality coffee

		(1)	(2)
Farmer	Coffee in the hamlet 25/22*	1,660.18	61.7%
	Bawon hulling coffee (4%)	75.50	2.8%
	Selling price	1,735.68	64.5%
Village trader's agent	Transport *ojek* Rp 100/kg/hour	112.48	4.2%
	Total costs	112.48	4.2%
	Profit	39.37	1.5%
	Selling price	1,887.53	70.1%
Village trader	Unloading, weighting 25/22	2.81	0.1%
	Drying, mixing, bagging 20/22	5.06	0.2%
	Weighing 20/22	0.53	0.0%
	Transport *ojek*	105.44	3.9%
	Unloading, loading 20/22	3.16	0.1%
	Transport by car	7.38	0.3%
	Total costs	124.38	4.6%
	Profit	52.72	2.0%
	Selling price	2,064.63	76.7%
Kecamatan trader	Unloading, weighing 20/22	2.11	0.1%
	Drying, mixing, bagging 17.75/22	3.08	0.1%
	Shed staff wages	1.05	0.0%
	Sorting wages (Rp 25/kg EK1)	12.50	0.5%
	Taxes and administrative costs	2.56	0.1%
	Financial costs	7.50	0.3%
	Transport Teluk Betung	25.63	1.0%
	Total costs	54.43	2.0%
Source of income:	Coffee quality EK1 (25%)	600.00	22.3%
	Coffee quality KB (25%)	550.00	20.4%
	Coffee quality *asalan* (50%)	1,000.00	37.1%
	Medium selling price	2,150.00	79.9%
	Profit	30.94	1.1%
Exporter	Unloading, weighing 17.75/22	2.05	0.1%
	Shed hiring (Rp 12/kg)	7.80	0.3%
	Processing (Rp 45/kg)	29.25	1.1%
	Hand sorting (Rp 30/kg)	13.00	0.5%
	Bagging (Rp 1000/60/kg)	10.79	0.4%
	Amortization (Rp 50/kg)	50.00	1.9%
	Administration (Rp 10/kg)	6.50	0.2%
	Financing (Rp 30/kg)	19.50	0.7%
	Wages (Rp 5/kg)	3.25	0.1%
	Conveying to harbor (Rp 3/kg)	1.95	0.1%
	Shipping (Rp 6 kg)	3.90	0.1%
	Freight to Rotterdam (US$ 0.1/kg)	107.25	4.0%
	Insurance (0.5% CIF price)	16.13	0.6%
	Export tax (5% CIF price)	100.81	3.7%
	AEKI subscription (Rp 15/kg)	9.75	0.4%
	Total costs	381.93	14.2%
Sources of income:	Exports to ICO members (32.5%)	1,104.68	41.0%
	Exports to non ICO (32.5%)	992.06	36.9%
	Local sales (32.5%)	595.08	22.1%
	Medium selling price	2,691.82	100.0%
	Profit	159.89	5.9%

(1): Rp kg of final product (coffee)
(2): % of consumer's price
Rp 1,650 US$, November 1st, 1987.
*: "25 22" designates coffee with 25% moisture and 22% residues.
Source: ORSTOM field surveys, 1987.

Appendix IV

Questionnaire Used During the Commercialization Survey in Lampung

1 Civil status
1.1 Date, place (*kecamatan, desa*)
1.2 Name, age, educational level
1.3 Ethnic origin, place of birth, date of arrival
1.4 Status (assisted migrant or spontaneous, with local ethnic group)
1.5 Reason(s) for migrating
2 Background information
2.1 Merchant's vocation, formation in the sector, date started, reasons for changing
2.2 Occupations
2.3 Starting capital: amount and source, evolution, bankruptcy and starting over
2.4 Investments: background, costs (purchase or rent), financing, contributions in kind or in cash
3 Size of the enterprise
3.1 Flow-chart: associates (functions, number, localization), amount of family and salaried participation.
3.2 Owner's other occupations: amount of time spent, function, yearly profit
4 Purchased goods by type of product (different qualities)
4.1 Frequency and quantities bought, dates of purchase and length of buying season
4.2 Purchase prices: maximum, minimum, average; evolutions in function of suppliers and regions, source of capital and responsibility for setting prices
4.3 Place of purchase, origin of product, person in charge, costs related to purchase (taxes, shipping, handling, etc.)
4.4 Type of salesman, number, quantity bought per transaction, nature of commercial relations, mode of payment
5 Transformation per type of product, different qualities, operations, technical characteristics, costs of processing
6 Resale of goods, per type of product, different qualities
6.1 Frequency, quantities sold and length of storage time
6.2 Maximum, minimum, average resale prices, variations in function of the regions and the clients, seasonal evolutions
6.3 Place of resale, person in charge, destination of products sold and related costs
7 Possessions, technical characteristics, date of purchase, price, planned use: house, shop, go-downs, other buildings, machines, transport material
8 Financial activity, nature, contractors, amount, length of time and conditions of reimbursing credits accorded or loans provided
9 Other costs, accounting kept, and by whom; paperwork, taxes and divers commissions, travel, meetings

10 Profit margin, per type of product, different qualities, profit margins employed and method or calculation
11 Investments, planned investments
12 Evolution over the past few years, prices, quantities produced, quality and origin of the products, processing operations and sales structure, structure of the sector, financing, technical progress, new laws, devaluations in 1983 and 1986, system of quotas, government interventions in production and commerce
13 Problems, limits, and possible improvements, obstacles to business and the operations of the sector. Possible improvements in production and commercialization. Level of action and role of the agent in the improvement of the sector

Appendix V

Acronyms, Abbreviations, Technical Terms and Vocabulary Used

Acronyms

AEKI	Asosiasi Exportir Kopi Indonesia (Indonesian Coffee Exporters' Association)
AELI	Asosiasi Exportir Lada Indonesia (Indonesian Pepper Exporters' Association)
ASPEMTI	Asosiasi Produsen dan Exportir Makanan Ternak Indonesia (National Association of Producers and Exporters of Livestock Feeds)
BPS	Biro Pusat Statistik (Central Statistics Bureau)
BRI	Bank Rakyat Indonesia ("People's Bank of Indonesia", the equivalent of the French "Credit Agricole")
DP	Departement Pertanian (see "MOA")
DPDG	Departemen Pedagangan (see "MOC")
DPK	Departemen Perkebunan (Directorate General of Estates attached to the MOA-see "MOA")
FAO	Food and Agriculture Organization, headquarters is Rome
GATT	General Agreement on Tariffs and Trade; regulates and controls international commerce
ICO	International Coffee Organization; regulates international coffee trade through a system of export quotas
IMF	International Monetary Fund
IRRI	International Rice Research Institute, based in Los Banos, the Philippines
MOA	Ministry of Agriculture
MOC	Ministry of Commerce
MOT	Ministry of Transmigration
ORSTOM	Formerly, the Office de la Recherche Scientifique et Technique Outre-Mer, this organization, incorporated into the French Ministry of Education, has been renamed the Institute Francais de Recher Scientifique pour le Developpement en Cooperation.
PPMB	Pusat Pengujian Mutu Barang, or Center for Quality Control and Testing. This MOC agency controls the quality of products destined for export.
REPELITA	Rencana Pembangunan Lima Tahun (5-Year Development Plan). REPELITA IV has been in effect since April 1, 1984, and will continue to March 31, 1989

SOSPOL	Social and Political Office of the Ministry of the Interior
V.O.C.	Vereenigde Oost-Indische Compagnie, the Dutch East India Company created in 1602 and bankrupt in 1796
WB	World Bank

Technical Terms

BC	Bill of exchange allowing the exporter to receive payment for his exported products through bank transfers
BIMAS	Bimbingan Masal, the programme of instruction on rice-growing techniques, carried out through a network of agricultural extension and training. Along with the INMAS programme it has assisted the Indonesian "green revolution". Foremost world importer of rice in the 1970's, Indonesia has been self-sufficient since 1983.
chips	see *gaplek* and pellets
CIF	Cost of Insurance and Freight. On import, the CIF cost of a product is the price of this product plus the loading fee, cargo fee and insurance fee. The on-board costs (1) off-loading costs (2) and customs costs (3) are borne by the buyer. The terms "CIF exquay" (inclusion of costs (1) and (2) in the purchase price) and "exquay cleared goods" (CIF ex-quay with cost (3) included) are sometimes used.
EKI	Quality of market coffee, corresponding to the present international ICO grades III and IV
FOB	Free on Board. On export, the FOB price of a product is the price of the product including transport to the departure quay. The buyer is responsible for the merchandise at the loading stage; in other words, he is to organize and pay for part of the loading, transport, insurance, and various other shipping fees as well as the off-loading and customs fees.
gaplek	Peeled cassava that is cut into two lengthwise halves and dried for 2 to 3 days to 13% humidity
INMAS	Intensifikasi Masal, the intensive rice-growing programme operating under a system of credit in the form of agricultural equipment.
IR 36 and 38	High yield rice varieties selected by the IRRI. Their discovery was instrumental to the elimitation, in the mid-70's, of the problems caused by the *wereng* and thus ensured the increase in Indonesian rice yields.
KB	Quality of market coffee corresponding to the international ICO grades V and VI.
KUD	Koperasi Unit Desa, or village co-operative.
model RCFC	System of installation for government-assisted transmigrants based on subsistence crops (rice, maize, and cassava grown on upland fields)

model SP	System of installation for government-assisted transmigrants based on plantation crops.
model IFTF	System of installation for government-assisted transmigrants based on irrigated rice cultivation using the tidal bore.
paddy	Unhusked rice
pellets	To obtain cassava chips and pellets, the gaplek are pounded into chips 3 to 5 cm in diameter then steam-pressed and finally dried in cylindrical pellets 2 to 3 cm long and 0,5 cm in diameter.
PMU	see UPP
SPM	Surat Pernyataan Mutu, certificate of quality for agricultural export products, delivered by the PPMB (see "PPMB")
shifting cultivation	traditional itinerant form of farming using slash-and burn methods.
strip-picking	coffee harvesting technique done by pulling all the grains from the same branch whether or not they are all mature.
tapioca	cassava flour obtained after the cassava has been crushed, dried in the sun for 4 days, and pounded into a white powder.
triase	discards left after sorting.
UPP (PMU)	Unit Pelaksana Proyek: unit in charge of the realization of a project for the development of a plantation crop.

Abbreviations

cc	cubic centimetre
cm	centimetre
GNP	Gross National Product
H_2O	water
H	hour
ha	hectare
inhab	inhabitants
Rp	Indonesian Rupiah, exchange rate 01/12.87:Rp. 1,645/ US$ 1
kcal	Kilocalorie
kg	Kilogram
km	Kilometre
t	Ton
US$	U.S. dollar

Vocabulary

anak buah	literally, "baby fruit", this term indicates the employees, the boss' workers (see "BOSS")
bawon	Portion of the harvest given to the farm labourer. In more general terms, *bawon* is payment in kind in % of work done.
boss	Widespread concept in these islands, this term designates the person for whom one works, even occasionally, and with whom is formed a relationship comparable to that between parents and children.

Bupati	Head of a *kabupaten*
Camat	Head of *kecamatan*
Desa	Village
gorong-royong	collective work done through mutual assistance
Gubernur	provincial Governor
Irian Jaya	Western part of New Guinea belonging to Indonesia since 1962
Kabupaten	administrative zone (district)
Kalimantan	official name for the Indonesian sector of the island of Borneo.
Kecamatan (*Kec.*)	subdistrict
Kepala desa	village headman, the Mayor
Kotamadya	urban district.
Lampung *Selatan*	District of South Lampung, prefecture Kalianda (major city: Pringsewu)
Lampung *Tengah*	District of Central Lampung, prefecture Metro
Lampung *Utara*	District of North Lampung, prefecture Kotabumi.
NES	Governmental project for the development of a plantation crop, in which a State plantation takes charge of preparing the land for the small-holders.
Panjang	see Teluk Betung.
pedagang lokal	coffee wholesaler who collects the production and distributes it to the exporters.
Sumatra *Selatan*	province of South Sumatra.
Tanjung Karang	see Teluk Betung
Teluk Betung	Along with Panjang and Tanjung Karang, this town makes up the present-day capitol of Lampung Bandar, Lampung (500,000 inhabitants).
tukang ojek	motorcyclist who hires out his services for the transport of persons and goods in isolated areas.
wereng	destructive insects, genus *Nillaparvata and Nephotettix sp.*

Administrative boundaries of Lampung

Table 59 Lampung's *Kecamatan* (1983)

Lampung *Utara*		Lampung *Tengah*		Lampung *Selatan*	
1	Pesisir Selatan	25	Kalirejo	48	Cukuh Balak
2	Pesisir Tengah	26	Bangun Rejo	49	Padang Cermin
3	Pesisir Utara	27	Padang Ratu	50	Kedondong
4	Balik Bukit	28	Gunung Sugih	51	Pardasuka
5	Sumber Jaya	29	Trimurjo	52	Kota Agung
6	Bukit Kemuning	30	Metro	53	Wonosobo
7	Kota Bimi	31	Batang Hari	54	Talang Padang
8	Sungkai Selatan	32	Sekampung	55	Pulau Panggung
9	Kasui	33	Jabung	56	Pagelaran
10	Blambangan Umpu	34	Labuhan Maringgai	57	Pringsewu
11	Pakuon Ratu	35	Way Jepara	58	Sukoharjo
12	Tulang Wawang Udik	36	Sukadana	59	Gading Rejo
13	Tulang Bawang Tengah	37	Pekalongan	60	Gedong Tataan
14	Menggala	38	Punggur	61	Natar
15	Mesuji Lampung	39	Terbanggi Besar	62	Kalianda
16	Belalau	40	Seputih Raman	63	Katibung
17	Tanjung Raja	41	Raman Utara	64	Penengahan
18	Abung Timur	42	Purbolinggo	65	Palas
19	Abung Barat	43	Rumbia	66	Tanjung Bintang
20	Abung Selatan	44	Seputih Banyak	67	Sidomulyo
21	Sungkai Utara	45	Seputih Mataram		
22	Banjit	46	Seputih Surabaya		
23	Baradatu	47	Gunung Balak		
24	Bahuga				

Source: Annual Report 1983. *Kabupaten* Lampung *Utara*, *Selatan* and *Tengah*.

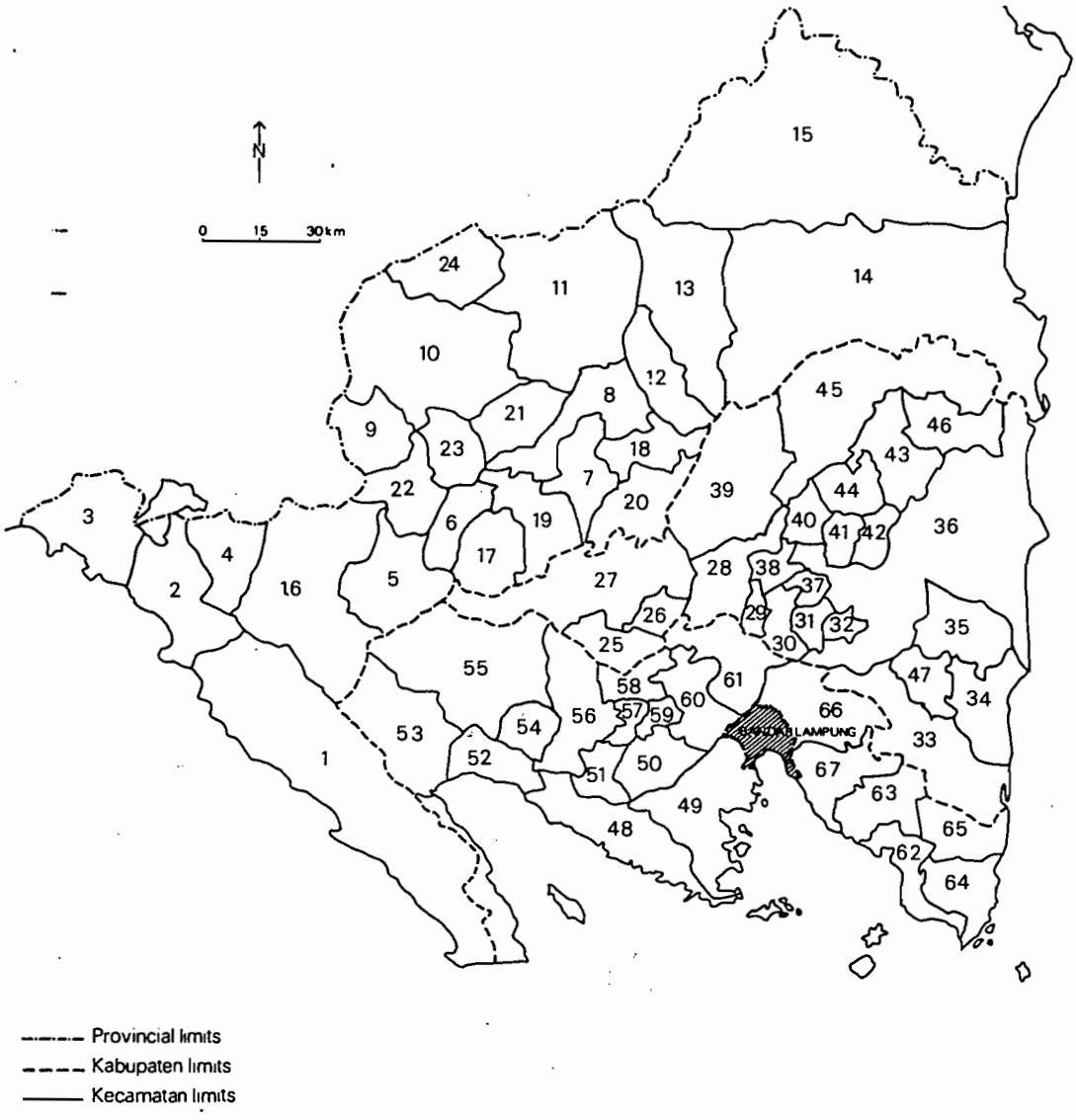

Figure 21 Administrative Boundaries of Lampung

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Photographs

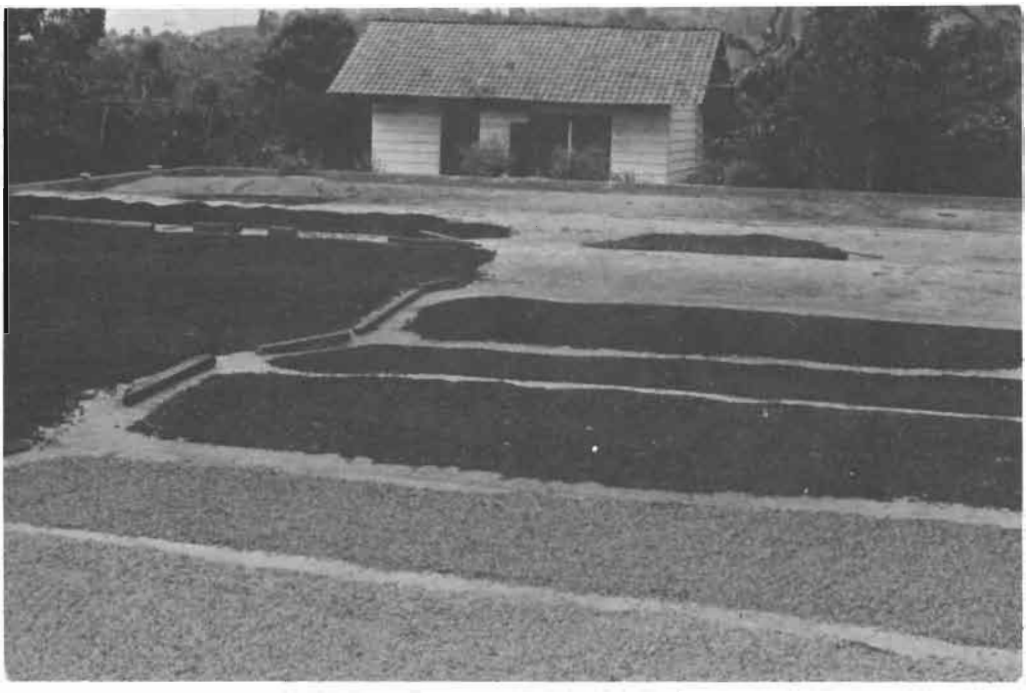
1. Non-assisted migrants usually have no other choice than to settle in remote areas.

2. During the first years after installation, isolation is often critical.

3. As no proper infrastructure is available, the "*tukang ojek*" becomes the only way of transporting goods and people in the mountains.

4. During the rainy season, all the road network becomes almost unusable, even in developed areas, because of late and inadequate maintenance.

5. Adverse climatic conditions during the processing diminish the final quality of agricultural products.



6. The use of concrete drying floors increases considerably the quality of the products.

7. Drying and "pre-hulling" of coffee on the main street.

8. Handling of agricultural products is often not done by the farmers and the coolies.

9. Sponsored by the public or private sector, farmers can successfully associate for upgrading the quality of their products.

10. Lack of capital for investing in proper processing equipment gives the isolated farmers little chance of getting higher prices for their products.

11. Insufficient harbor equipment leads to too many handling operations and increases the costs.

12. Shipping cost is US$ 20/ton cassava from Lampung to Rotterdam, compared to US$ 12/ton from Bangkok to Rotterdam.

13. Farmer's prices thus rise, opening a chance for all to raise their living conditions.

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