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The Jengka Triangle Projects in Malaysia

IMPACT EVALUATION REPORT

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FOREWORD

This report by the World Bank's Operations Evaluation Department (OED) covers three World Bank supported projects for which loans in the amount of US$52 million had been approved in 1968, 1970 and 1973. This impact evaluation spans a period of seventeen years during which the Jengka Triangle was developed from essentially forest and swamp lands to successful palm oil and rubber schemes providing livelihood for about 9,400 families drawn from the landless poor. The Federal Land Development Authority (FELDA) can be credited with having successfully implemented and sustained this scheme.

Operations evaluation in the World Bank aims to provide a systematic, comprehensive and independent review of the Bank's development experience. The Director General Operations Evaluation (DGO) has overall responsibility for the evaluation function. The DGO reports directly to the Bank's Board of Executive Directors with an administrative link to the president. The Operations Evaluation Department (OED) is the staff arm of the Director General. All its reports are made available to the member governments of the Bank and those of general interest are published.

While preserving their statutory and professional independence, OED staff work with Bank staff and country officials so that all views, including dissenting views, are adequately reflected in OED reports. This practice has been followed in producing this report which has been distributed to the Bank's Board of Executive Directors. However, the opinions expressed in the report do not necessarily represent the views of the Government of Malaysia, FELDA or the World Bank.

This impact evaluation of the Jengka Triangle was carried out by an OED team comprising Kathryn McPhail, Christian Polti and Antony Whitten (Consultant). The impact evaluation draws extensively on a socio-economic survey commissioned by OED and undertaken under the supervision of Mr. Sinnatamby Selvadurai.

We hope that this impact evaluation, concentrating on sustainability which accounts for the successful outcome of these three projects will not only be useful to FELDA and the Malaysian authorities but be replicable beyond. Settlers everywhere could benefit from the lessons learned from this development experience.

Yves Rovani
Director General
Operations Evaluation

ABBREVIATIONS

BOD	-	Biological Oxygen Demand
CIF	-	Cost, Insurance and Freight
DID	-	Drainage and Irrigation Department
EIA	-	Environmental Impact Assessment
ERR	-	Economic Rate of Return
FELDA	-	Federal Land Development Authority
FFB	-	Fresh Fruit Bunch
FOB	-	Free on Board
GDP	-	Gross Domestic Product
GOM	-	Government of Malaysia
GPW	-	Gerakan Persatuan Wanita (Women's Institute)
HYV	-	High Yield Variety
JKKR	-	Jawatankuasa Kemajuan Rancangan (Scheme Development Committee)
JKR	-	Public Works Department
KTDA	-	Kenya Tea Development Authority
OEA	-	Office of Environmental Affairs, World Bank
OED	-	Operations Evaluation Department
PCR	-	Project Completion Report
PPAR	-	Project Performance Audit Report
RISDA	-	Rubber Industry Smallholders Development Authority
RRIM	-	Rubber Research Institute of Malaysia
SDA	-	Social Development Officer

WEIGHTS AND MEASURES

1 Acre	:	0.405 Hectares
1 Mile	:	1.601 Kilometers
1 Square Mile	:	640 Acres
2,204 Pounds	:	1 Metric Ton

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SUMMARY AND CONCLUSIONS

1. The three Jengka Triangle projects were the first of a series of six Bank loans to the Government of Malaysia for the development of new lands to be planted to oil palm and rubber and settled by landless people. The projects were part of a large government development and settlement program which started in 1956 with the Federal Land Development Authority (FELDA) as executing agency, and which, by the end of 1984, had achieved the settlement of about 89,000 settler families on more than 600,000 ha.

2. The three projects, approved in 1968, 1970 and 1975 respectively, consisted of the clearing of about 40,000 ha of jungle, the planting of 26,000 ha of oil palm and 13,800 ha of rubber, the construction or expansion of 4 palm oil mills, the construction of roads, villages and related social infrastructure and the settlement of about 9,200 smallholder families on a 4-ha plot each. Settlers were to repay investment costs related to land development and housing over a period of 15 years.

3. The projects were implemented from 1968 to 1980, and were audited by OED in 1978, 1980 and 1982, respectively. The main findings of the PPARs were that planting targets had been met or exceeded. Settlement has been somewhat delayed by late construction of roads, houses and social infrastructure. Despite time and cost overruns, project ERRs were satisfactory and significantly higher than appraisal estimates, mostly due to palm oil and rubber prices higher than those projected at appraisal. The PPARs also noted the good performance of FELDA, the efficient, but costly, settlement system, a significant improvement of settlers' incomes, a satisfactory cost recovery from settlers, the need for improvement of oil mill operations and the insufficient attention paid to environmental and wildlife aspects during project implementation. Contrary to expectation, no socio-economic survey was carried out by the Government at project completion.

4. By the time of this impact evaluation, seventeen years after the first investment and four years after completion of the third project, two thirds of oil palm and about 20% of rubber plantings have reached the full production stage, thus allowing for a more accurate estimate of the agricultural, economic, social, financial and institutional impact of the projects.

5. The recalculated ERRs for oil palm and rubber have been found to be equal or higher than projected at appraisal, although slightly lower than estimated at project completion. High yields, mostly of oil palm, have partly compensated lower-than-expected prices for both commodities and increased operating costs.

6. The socio-economic survey of settlers showed a general satisfaction of FELDA settlers. Settlers' incomes are about 3- to 3.5-fold above the rural poverty level, and significantly higher for oil palm settlers than for rubber settlers. A large number of commercial activities have been developed by settlers and encouraged by FELDA. However, incomes derived from these activities are lower than expected. The survey showed that settlers' increased incomes have been translated into significant improvement in living conditions. Social infrastructure, particularly education, has been an important factor in both attracting and retaining settlers.

7. Although women play a major role in the agricultural activities, rubber in particular, overall women's rights have not been fully recognized. Urban development in the Jengka area was planned since the early 1970s, but is still at its early stage, resulting in a lack of job opportunities for settlers' children.

8. The financial impact of the projects has been positive for all parties involved in Jengka. While settlers have increased their living standards, FELDA enjoys a healthy financial position and the State of Pahang and the Federal Government have been able to obtain substantial revenues from the projects through land taxes and export duties. The cost recovery rate from settlers has been excellent for oil palm but less satisfactory for rubber, resulting in the need to extend repayment periods beyond the initially planned period for rubber settlers.

9. The project's negative impact on the environment was found to be less severe than expected at project completion. Soil erosion due to land clearing was minimal; all oil palm mills have been equipped with efficient treatment plants; there is no indication that climatic change has resulted from the development of Jengka. The clearing of forest land, however, had a considerable effect in terms of reduction of wildlife populations, as protection measures now used in some countries were not known at the time the projects were implemented.

10. Institutional effectiveness has been the most striking feature of the projects. FELDA has grown into one of the most successful land organizations in the world, combining the efficiency of the private sector with the public service of a government agency. Although FELDA's settlement system has been criticized as too costly, it was designed to eliminate risks and proved successful. However, FELDA's approach has its limitations. The extent of control exerted by FELDA over settlers' lives has been one of the reasons for project success but has also resulted in stifling the settlers' sense of initiative and self-management. It is not desirable that settlers who have been assisted for so many years continue to absorb scarce resources which could be better used for helping the remaining poor. It is also unlikely that the tight system of management control currently exerted by FELDA will be readily accepted by settlers' children, who will have had more education than their parents.

11. The most important factors accounting for project success and sustainability of benefits have been: project design, Borrower support, adequate project organization and a sound settlement system.

12. The projects were designed to make the best use of Malaysia's comparative advantages--oil palm and rubber--and was based on a development approach minimizing all risks and combining the best of the smallholder agricultural sector with that of the private sector.

13. The projects benefitted at all times from supportive government policies with clearly identified and long-term strategic plans. As an instrument of the Government's policies, FELDA has been able to perform remarkably well thanks to the continuity and high quality of its senior management and the motivation of its staff. The projects illustrate that a parastatal organization can successfully combine both commercial and social objectives. FELDA's management style, however, has considerable implications for the future: it cannot last forever and will have to evolve into a settler self-management system.

14. The social benefits of the projects have been achieved because (i) FELDA's settler system was modelled after the structure and organization of the Malay villages, and (ii) the size of holdings and adequate social infrastructure were able to satisfy aspirations and ensure incomes of the landless poor on a long term.

15. Although it is difficult to assess whether project success relies mostly on Malaysian conditions, some lessons for replicability in other countries can be drawn from the Jengka projects:

(a) a high value crop and a sound technical package are essential for providing sufficient financial returns to all parties involved in this type of project;

(b) conditionality attached to land ownership is a key incentive in settlement projects; it induces settlers to accept discipline, which is essential in the early settlement period for eventual project success, and gives Government good leverage to develop an orderly settlement system;

(c) combining an improved social infrastructure with some aspects of the traditional village system is an important factor for both attracting and retaining settlers;

(d) when other sectors of the economy are growing rapidly it seems almost impossible for new job opportunities to develop within a rural environment for the second generation; integrated rural-urban development is difficult and time-consuming;

(e) settlement projects have a better chance of success if they are executed by a strong autonomous agency with a clearly identified plan and strategy and the full support of Government.

I. BACKGROUND

A. Malaysian Economy 1966-1984

1.01 The striking record of economic growth in Malaysia over the period 1966-84 can be attributed to its rich endowment with natural resources and government policies which have (a) encouraged private investment and technological innovation, (b) promoted the optimal allocation of resources by encouraging production according to specialization for trade, and (c) reacted quickly to changing international economic circumstances. These have combined to give Malaysia a commanding position in a region characterized by abundance of natural resources and a record of sustained economic growth.

1.02 Since the beginning of the century, rubber production and tin mining for overseas markets, encouraged by free movement of labor and capital, have been the main forces of economic growth in Malaysia. By the mid sixties, the commodity concentration of domestic production reflected this historical development process: rubber and tin accounted for over 50% of commodity exports, which in turn comprised about 45-50% of GDP. Growth in GDP has continued strong, increasing at an average annual rate of 6.5% between the period 1960-70 and by 7.7% during the following decade. This together with its small, 15 million population have combined to give Malaysia one of the highest per capita incomes in the region: US$1,860 in 1983 compared with US$2,010 in Korea and US$820 in neighboring Thailand. Malaysia's population, 60% of whom are literate, is ethnically rich, comprising 48% Malays, 34% Chinese and 9% Indians.

1.03 The strong growth in GDP has been encouraged by sound macroeconomic policies. First, the domestic economy is particularly vulnerable to changes in the terms of trade (a vulnerability accentuated by the fact that 80% of agricultural land is cultivated to treecrops and thus cropping patterns cannot quickly respond to international price signals), but considerable emphasis has been given to improving productivity and maintaining competitiveness of the important export commodities to counter the effects of cyclical world prices. Second, attention has been given to diversification of the production structure in the export sector, by a shift towards palm oil production in the early seventies and, more recently, towards cocoa. At the same time, import substitution has proceeded rapidly both in agriculture, notably in respect of rice production, and in industry, while manufactured exports are now expanding, particularly electronics and textiles. Third, the Government has provided the necessary supporting infrastructure while at the same time creating a financial climate generally conducive to private initiative: stable prices with relatively free movement of goods and services.

1.04 Since 1980, the rate of growth in GDP has slowed, in large part due to the effect of the international recession which has had a significant impact on the Malaysian economy because of its openness. Government efforts to counter the recession's impact by increasing public spending have contributed to high deficits on the current account of the balance of payments. As a result, renewed attention is being given to the agricultural sector which has traditionally been the bulwark of Malaysia's favorable trade balance.

B. Agricultural Sector

1. Background

1.05 Unlike many countries where national development plans tend to be statements of intent only with little guidance as to what strategies support government objectives, Government has always had clearcut goals in respect of development of the agricultural sector.

1.06 In keeping with overall economic objectives, public agricultural policy in Malaysia has been formulated within the framework of:

- poverty alleviation;
- protection/diversification of the production base; and
- provision of infrastructural services.

The Government is particularly committed to increasing rural incomes, since some of the largest concentrations of poverty are to be found in this sector, and creating opportunities to reduce the incidence of rural-urban migration. The principal focus, however, has been to formulate a series of detailed development plans on a nationwide, crop-specific basis to be implemented by single commodity agencies. These plans are essentially production oriented in that production targets and strategy are set for each crop, for example, in terms of protecting world market shares or achieving self-sufficiency. Land is gazetted according to which crop is to be grown, funds are budgeted and supporting services mobilized by crop, e.g., rubber, coconut, etc.

1.07 Development expenditure for the agricultural sector between the period 1966-84 concentrated on three main areas. First, the provision of additional irrigation and drainage facilities to increase volume produced through double cropping of rice and increase yields, since water control would permit the use of high-yielding varieties (HYVs), fertilizers and pesticides. Second, financial and other assistance for replanting with high-yielding rubber trees on smallholdings in order to retain Malaysia's competitive edge in world markets. Third, development of virgin jungle for land settlement to assist in diversification of crops for export and overcome one of the major constraints of the rural sector: subeconomic land holdings.

1.08 Physical production expanded rapidly in the years up to 1976 with the sources of agricultural growth arising largely from increased yields of rubber, rice and oil palm per hectare, together with a substantial increase in area cultivated to oil palm. The sector continued strongly thereafter as

a result of the commodity boom between 1976-80. Since 1980 there has been a slowing due to a decline in output as well as changes in the terms of trade. The reasons for this downturn are largely due to the long-term structural shifts in the economy where resources are moving to higher-value occupations. Labor costs in the rural areas are rising rapidly, resulting in low returns to labor and declining output of crops.

1.09 The net result of this strong showing overall in the agricultural sector has been a decline in poverty incidence in the rural areas: from 68.3% in 1970 to 46.1% in 1983. Since the largest incidence of rural poverty is to be found amongst padi and coconut farmers as well as fishermen, public investment in major irrigation works, new land development, technical and financial support for rubber replanting and the overall high growth rate in total output of the economy have clearly been responsible for this improvement.

2. Rubber and Oil Palm Development

1.10 The Government has always been strongly committed to encouraging Malaysia's natural comparative advantage. Her four principal exports--palm oil, rubber, tin, timber--all reflect her factor endowments. Malaysia is uniquely suited to the production of treecrops. The undulating slopes which typify much of peninsular Malaysia are best suited to perennial crops which are similar in requirements to that of the indigenous jungle and much less suited, because of potential soil erosion, for either annual crops or pasturage. Moreover, climatic conditions, with well-distributed annual rainfall of 2,000 to 2,500 mm and average temperatures of 25°C to 30°C are particularly favorable to cultivation of oil palm and rubber. These topographic and climatic advantages were recognized early in the twentieth century. Large areas were opened up to rubber, both by large estates and smallholders, when demand increased rapidly in the industrialized countries. Research organizations were established and developed advanced technologies.

1.11 This climatic and ecological advantage in cultivating treecrops has since been reinforced by economic considerations, particularly the land/labor ratio in Malaysia which has continually favored treecrops over annual crops. Land pressure has not constrained large estate plantations from being developed by foreign interests, encouraged by government policies allowing the free movement of labor, capital and technology.

1.12 Little replanting of rubber occurred between the depression in the 1930s and the end of the emergency in the 1950s with the result that when the Government established the Rubber Industry (Replanting) Board in 1952, two-thirds of the rubber trees were over 25 years old. The Act provided for two funds, one to provide incentives for estates and the second aimed at smallholders. The estate fund returned cess monies to those estates implementing a satisfactory replanting program, whereas the smallholder fund financed major field activities in promoting and supervising replanting. Between 1950-60, much of the estate sector was replanted to rubber. It was not until the following decade that trees were replanted in the smallholder sector when the financial returns were improved through increased subsidies.

1.13 As a result of this investment, rubber output expanded steadily from 700,000 tons in 1960 to 1.5 million tons in 1982, largely due to the increased yielding clones which offset a decline in area planted. Thus rubber output per worker increased from 1.2 tons in 1960 to 2.2 tons in 1982. Much of the land taken out of rubber--overall area declined from 69% of cultivated land in 1965 to 44% in 1983--has been planted to oil palm where area planted rose from 2.4% in 1965 to 26% by 1983. Output increased from 90,000 tons of crude palm oil in 1960 to 3.3 million tons in 1983. Output per worker has increased from 8.8 tons in 1960 to 25 tons in 1983. This rapid increase in area combined with high yields obtained under Malaysian conditions has served to make oil palm the wonder crop of the agricultural sector in particular and the economy in general. In 1965, 73% of world palm oil output was produced in Africa; Malaysia's palm oil production now accounts for more than 50% of world output and more than 60% of world exports. Malaysia is also the biggest rubber producing and exporting country in the world, accounting for 35% of world production.

3. FELDA: Objectives, Organization, Settlement Policy

1.14 Private investment in the treecrop estates sector slowed after World War II and at the same time Government was keen to secure land rights for smallholders. Government envisaged that large-scale alienation and development of new lands would provide smallholders with opportunities to cultivate high-value crops employing modern production techniques on economic size holdings[1/]. This was a significant departure from earlier colonial government policy--particularly noticeable in the rubber industry--when smallholders were, in effect, given little encouragement to plant HYVs.

1.15 The principal mechanism for this program has been the Federal Land Development Authority (FELDA)--a statutory body established in 1956. FELDA operates within the Ministry of Land and Regional Development receiving policy guidance and supervision from a Board of Directors which includes representatives from both Government and the private sector. In addition, eighteen settler leaders are now on the FELDA Board and the Boards of FELDA corporations. Total FELDA staff in 1984 stands at 8,000, of which about 75% are in the settlement schemes, 13% in operating departments, 9% in head office and 2% in training facilities and schools. Since 1972, FELDA has established eleven subsidiary corporations and has entered into six joint ventures with the private sector to undertake downstream activities related to its agricultural activities. These are operated on a commercial basis, largely independent from FELDA and with their own staff and resources. FELDA settlers throughout the country are now holding equity shares in these eleven FELDA subsidiary corporations with a total paid up capital of M$143.1 million.

1.16 FELDA's principal objective is to combine the management system of the plantation sector, on which much of the economy depends, with the

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1/ As late as 1976, it was estimated that in peninsular Malaysia 40% of the landholdings were less than 1 ha, for which no available technology was available to generate incomes above the poverty level.

socioeconomic objectives of Government. FELDA has evolved a policy whereby production is paramount and, once agricultural production is secured, changes in living patterns and in social organization of settlers have followed. The strategy by which this is accomplished is an integrated package. Land is vested in FELDA for development. The ownership of the land still lies with the state government who will issue land title to the settlers upon completion of their loan repayment to FELDA. First, detailed land use plans are prepared for schemes of between 1,600 and 2,000 ha[2/]. Jungle is cleared using contract labor who are also employed to plant and maintain the young stands until about 3-4 years from initial planting.[3/] Contract labor is also engaged to construct settler houses, community centers and mosques, while the Public Works Department (JKR) is responsible for provision of rural roads, clinics, and schools. FELDA provides processing facilities for oil palm because the fresh fruit bunches (FFBs) must be processed shortly after harvest to maintain good extraction rates. FELDA also provides processing facilities and collecting centers for rubber. New settlers, selected by FELDA from amongst the landless poor, are brought in shortly before the first harvest and provided with a house, a 0.1-ha garden plot and potential title to a 4-ha treecrop plot. In the case of oil palm, the plot has to be cultivated as part of a larger 80-ha block and in both cases cannot be sold or subdivided once title is obtained, since settlers have right of usufruct only; the land is not freehold. Rubber settlers cultivate their 4-ha plot individually. Settlers receive a guaranteed minimum income until farm incomes reach breakeven. This, together with the loan for the plot, is repaid over a period of 20 years plus a premium for credit, marketing, technical assistance, inputs, and processing services provided by FELDA. By the end of 1984, FELDA schemes covered more than 600,000 hectares. About 89,000 settler families, representing about a half million people, have been settled in 367 FELDA schemes.

4. Bank's Contribution to Agriculture and to the Oil Palm/Rubber Subsector

1.17 Bank lending to Malaysia for agriculture as of April 30, 1985, reached a total of US$685.9 million, or almost 45% of the total lending to Malaysia. These loans supported 24 projects, beginning with Muda

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2/ These schemes were expected to support about 400 settlers and their families--regarded by FELDA as a viable minimum. Since the early seventies, however, and in keeping with Government's urbanization policy, FELDA is now developing centers with upwards of 1,000 settlers which, it is hoped, will offer more amenities and job opportunities.

3/ Settlers for both oil palm and rubber are scheduled to be in place 3 to 4 years after initial planting. However, delays in the preparation of basic infrastructure have affected this timing in a number of schemes in the past.

Irrigation[4]/ in November 1965. Early Bank lending concentrated on irrigation in the northern padi growing areas and on support to FELDA for land settlement: the three Jengka projects being the first followed by two projects to the south--Johore Land Settlement project in the state of the same name and Keratong Land Settlement project, located, like Jengka, in Pahang state. Bank lending accelerated in 1978 with five projects approved in that year alone, the portfolio also diversified with additional emphasis being given to national programs of agricultural research and extension as well as to area development. Further support was given to poverty alleviation: the Coconut Smallholders project was expected to provide alternative opportunities for coconut farmers, while the series of integrated area development projects was targetted towards these farmers operating on scattered and fragmented smallholdings with little access to modern technology. IFC has made a total of six equity investments and/or loans to private companies engaged in cement, steel, textile and pulp and paper activities. All these investments were undertaken in the 1960s. IFC has no projects under active consideration at present.

1.18 The global context to Bank support for the rubber and oil palm subsector in Malaysia is relevant. As part of Bank lending throughout the world for oil palm and rubber development, consisting of some 62 projects in 14 countries for a total lending of US$2,075 million (Annex 1.1), the six projects in Malaysia constitute 10% of the total project effort and 7.5% of the Bank's overall lending in the oil palm and rubber sector. Bank support in Malaysia has been exclusively directed to the smallholder sector in contrast to that of other major borrowers which have either combined smallholder development with nucleus estates or concentrated almost entirely on estate plantations.

1.19 Increasing smallholder production of oil palm and rubber in Malaysia has been either through the medium of FELDA or more indirectly in seeking to remove some of the constraints to production, e.g., by drainage improvement on existing land planted to oil palm or rubber. Between the period 1968-84, Bank support for FELDA has been on a scheme-by-scheme basis. Six loans totalling US$156 million have been made to Government and on-lent to FELDA on concessionary terms, representing about 20% of FELDA's land development program. These Bank-supported projects cover 66 settlement schemes in which a total of 120,750 ha has been developed, 29,450 families settled and 15 palm oil mills established. As of March 1984, FELDA's 367 settlement schemes consisted of 66% oil palm, 30% rubber and 10% cocoa.

1.20 Current Bank support to FELDA is changing in keeping with developments in the treecrop sector in Malaysia. Between 1980-84 the annual area developed by FELDA declined from 40,000 ha p.a. to 30,000 ha p.a., principally because much of the land most suitable for large-scale development to oil palm has already been alienated (FELDA has now adopted a policy of limited planting to rubber in areas which are not suitable for oil palm and

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4/ Which, combined with the Kemubu Irrigation Project, has been the subject of an OED impact evaluation (OED Report No. 3587, dated August 24, 1981).

cocoa). As a result, apart from new land development in Sabah and Sarawak, FELDA is consolidating rather than expanding its agricultural activities. Bank assistance to the oil palm and rubber subsector is now more towards financing individual components of FELDA's land settlement program, for example, oil palm mills or physical infrastructure, rather than supporting the development of new settlement.

1.21 Parallel to Bank support to FELDA has been a program of investment in land improvement which has enabled smallholder rubber and oil palm to be rehabilitated/replanted. Considerable attention has been given to drainage improvement and flood control in the smallholder sector, for example, the Western Johore Agricultural Development, North Kelantan and North West Selangor projects. These have benefitted rubber production and to a lesser extent oil palm, since cultivation must be undertaken in some proximity to processing facilities.

C. Projects' Design, Implementation and Outcome

1. The Jengka Triangle Master Plan

1.22 The Jengka Triangle, situated 120 miles northeast of Kuala Lumpur in the state of Pahang, covers an area of about 120,000 ha, of which about one-half was considered suitable for agricultural development, with one-third of that already being leased or occupied. Jengka was identified in the early sixties as having potential for large-scale treecrop development and settlement. While land settlement had proceeded previously in Malaysia, the pattern had tended to be on a small scale close to existing facilities and infrastructure; Jengka was to be the first such effort to develop undisturbed forested areas.

1.23 The project was initially prepared by FELDA; discussions with the Bank began in 1963 when an identification mission proposed further study by a consultant team to be funded by the Bank. Accordingly, various studies assessing the natural resources of the Jengka Triangle and its potential for land use were carried out by land use/agricultural and engineering consultants between June 1965 and January 1967 concurrently with the preparation of an inventory of human and financial resources.

1.24 Recommendations were summarized in the first regional master plan for such development in the country. The plan called for the development of almost 45,000 ha comprising (a) the settlement of about 9,000 landless poor cultivating about 40,000 ha of oil palm/rubber; (b) the exploitation of forest resources; (c) urban development including the establishment of three new townships; and (d) extensive infrastructure development. Bank assistance to the program was to be confined to the land development component, which would be implemented by FELDA in a succession of three projects or "stages" over the period 1966-77, and to the forestry complex funded under a separate project (Loan 673-MA). Responsibility for the urban component was not initially allocated but was subsequently given to the Jengka Development Corporation, a state agency. Infrastructure development was to be implemented by the Public Works Department (JKR) of the Federal Government.

2. Project Description

1.25 The first stage assisted by Loan 533-MA of 1968, called the Jengka Triangle project, comprised about one-third of the total land development program and covered most of the unoccupied area on the eastern side of the triangle where about 11,000 ha of oil palm was to be developed in seven schemes (see map) settled by 2,770 families. Each settler was to receive a 4-ha plot of planted oil palm, a house and a garden plot of 0.1 ha. Settlement was to be grouped in villages of about 400 families; delivery of the FFBs to the FELDA processing facilities was compulsory. Settlers were to be charged for the cost of land development, house construction, farm inputs and processing. Bank assistance also provided for the expansion of an existing mill and construction of a new mill. Infrastructure development, included in project costs, was to be undertaken by JKR without Bank assistance. Costs of urban development were not included and were the responsibility of Government. The project also provided for the establishment of an agricultural research station and training for FELDA staff.

1.26 The second stage, referred to by the Bank as the Second Jengka Land Settlement project (Loan 672-MA of 1970), comprised the northwestern portion of the triangle. This project called for the development of 6,800 ha to oil palm in four schemes and 5,500 ha to rubber in three schemes, the housing and settlement of about 3,000 families, a town site to serve as regional center, construction of an oil palm mill and crop diversification trials at the research center.

1.27 The third stage, appraised as the Third Jengka Triangle project (Loan 885-MA of 1975), expected to complete the program with the planting of 8,600 ha in the southwest corner to oil palm and 7,300 ha to rubber, each under four schemes; the settling of 4,000 families; and providing the necessary physical infrastructure and an oil palm mill. The program was scheduled for completion in 1981.

3. Project Implementation

1.28 This impact evaluation refers to the three projects as Stages I, II, III, in keeping with FELDA terminology. The three Stages were indistinguishable and together covered a series of 23 contiguous schemes grouped under a management unit established by FELDA in 1968 to implement the three Bank-supported projects in the Triangle.

1.29 At completion, the PPARs concluded that all three projects had been implemented as planned. The core of the Bank-assisted program, the planting and settlement activities, proceeded largely on schedule with planting targets being generally met or exceeded: Stage I - 10,500 ha planted to oil palm and 1,400 ha to rubber, due to steeper slopes than expected in scheme 7; Stage II - 6,800 ha to oil palm and 5,200 ha to rubber; Stage III - 10,400 ha to oil palm and 6,800 to rubber, with Scheme 23 changed to oil palm due to more favorable soils than expected. Almost 9,400 smallholders were settled, although intake was delayed due to late construction of roads, houses and village infrastructure. Details on the agricultural development and the main social infrastructure constructed under the three projects is contained in

Annex 1.2. The three oil palm mills were constructed as planned; the existing mill increased its capacity. The three towns planned for the triangle did not develop (para. 3.37).

1.30 Project costs for all stages were higher than expected at appraisal:

Project Costs
(US$m)

	Appraisal	Completion
Stage I	29.1	34.5
Stage II	25.4	33.8
Stage III	43.3	69.6

Cost increases were a result of unforeseen increases in unit costs compounded by delays in construction of basic infrastructure, as well as increased planted area in Stage I. Despite time and cost overruns, the economic rates of return of all three projects at completion were satisfactory and in line with appraisal estimates. This, however, was mostly due to palm oil and rubber prices higher than those projected at appraisal. The rates of return were also higher for oil palm than for rubber (para. 2.18).

4. Projects' Outcome at Completion

1.31 Yields of oil palm were revised downward at completion of Stages I and III; no reestimate was made at completion of Stage II. The explanation given in the PPARs referred to over-estimation at appraisal, uneven soil quality, poor coordination of harvesting and transportation of FFBs, and delayed plantings due to damage from elephants and other fauna. The revised estimates in the completion report of the first project were, however, rejected by FELDA as being too low. Production of palm oil was affected by low extraction rates experienced in both the old and new mills financed by the projects--initially due to inefficient management and later to problems at the farm level. Rubber yields were similarly below appraisal expectations due to quality of tapping and wrong assumptions made at appraisal regarding the benefits of ethrel stimulation;5/ production was also affected by lower area planted, particularly in Stage II.

1.32 At completion of the first Stage in 1978, oil palm settlers' incomes were calculated at an average of US$2,200 per family; incomes were adversely affected by the low level of mill utilization. Incomes for rubber settlers were less easy to determine, as the one rubber scheme in Stage I was only in its first tapping year. Estimates expected that rubber incomes would be about 20-30% lower than those obtained from oil palm. Consumption standards in the schemes were high with motorcycles, durable goods and radios commonly seen. At completion of the second Stage, these same trends observed during the first phase were also noted. Yields continued to be satisfactory,

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5/ Production figures do not include "unofficially" sold rubber.

but oil palm settlers benefitted less than their neighbors in the first Stage because oil palm prices had dropped in the meantime. Overall incomes in the second Stage were also lower on average because this Stage has a greater area planted to rubber and rubber prices remained lower than those of oil palm. At completion of the third Stage, it was concluded that settlers were enjoying considerably better living standards compared to pre-project levels, but no socioeconomic survey had been undertaken as planned and thus incremental benefits were hard to quantify.

5. Findings of the PPARs

1.33 Three major findings of the PPARs concern institutional aspects, the costs and benefits of smallholder development and outlook for the future, particularly the phasing out of FELDA management and opportunities for settlers' children.

1.34 The PPARs noted that FELDA as a state-owned enterprise with its own distinctive management style and with a good cost recovery record was perhaps a more suitable entity for smallholder development than the more traditional project unit. Considerable attention was given to the costs of settlement, (about US$15,000 per family reflecting all expenses including processing facilities) the highest of any Bank-supported rainfed settlement schemes. FELDA's paternalistic style, which tended to preclude self-help activities, was noted particularly in the context of the question of detachment once the settlers repay their loans and receive title. A related issue raised was opportunities for settlers' children.

II. AGRICULTURAL AND ECONOMIC IMPACT

A. Agricultural Production

2.01 As harvest only starts in the third year from planting to oil palm, and the sixth year for rubber, agricultural production at projects' completion was difficult to estimate. By the time of this impact evaluation, two-thirds of the fifteen oil palm schemes are at full production, five rubber schemes started producing in 1980 and the three others in 1983, thus allowing for a more accurate estimate of yields and production. In addition, the area of some schemes, wrongly estimated at completion, has now been corrected.

1. Oil Palm

2.02 Integration of agricultural production and processing is important in the oil palm sector. The fruit of the oil palm contains two separate sources of oil: the pulp from which palm oil is extracted and a nut kernel in a hard shell from which palm kernel oil is obtained. Oil in the pulp of the fruit deteriorates rapidly and extraction needs to be carried out immediately after harvest in nearby mills. In contrast, palm kernels deteriorate slowly after drying and extraction of their oils may be carried out later, often in the mills of importing countries. Quantity and quality of palm oil,

kernel or kernel oil, depend on the yields of fruits and oil and kernel extraction rates. These in turn are related to the degree of fruit ripeness at harvesting, quick transportation to mills, and mill efficiency.

2.03 Total Fresh Fruit Bunch production of the three Stages since 1971 has been about 4.5 million tons, or 98% of completion and 81% of appraisal estimates. Charts 2.1 and 2.2. show FFB yields per harvest year and FFB production up to end of 1984 for each stage. At appraisal, FFB yields were expected to peak at 24.7 t/ha in the eighth harvest year and to decline slightly thereafter up to the 25th planting year, considered the end of the economic life of oil palms. At project completion, yields were revised downward by 15% due to overestimation at appraisal, uneven soil quality, poor timing and coordination of harvesting and transport of FFBs, deficient pollination and bad road conditions during the wet season.

2.04 In 1985, the six schemes of Stage I have reached their 12th, 13th or 14th harvest year and the yields are different from the PPAR's projections. Chart 2.1 shows that while yields were slightly below projections up to the sixth harvest year,[6/] they have been significantly higher since then. Between 1979-84, yields have been constantly higher (20%) than projected at project completion and even slightly higher (6%) than original estimates. Although yields have tended to peak in year 9, the decline thereafter is less pronounced than anticipated. As a result, Stage I FFB production, which remained lower than projected at completion up to 1978, strongly caught up thereafter (see Chart 2.2). Average production has been significantly higher than projected for the past years, with wide year-to-year variations probably due to the introduction of an insect (Cameroon weevil) for pollination.

2.05 Production of Stage II and III showed a similar pattern, with the yields below projections up to the sixth harvest year and catching up thereafter. The highest yields recorded (31.7 t/ha and 29.5 t/ha) of the three Jengka projects were obtained in Stage II, while Stage III has performed relatively poorly during the first harvesting years, mostly due to problems encountered during the planting period.

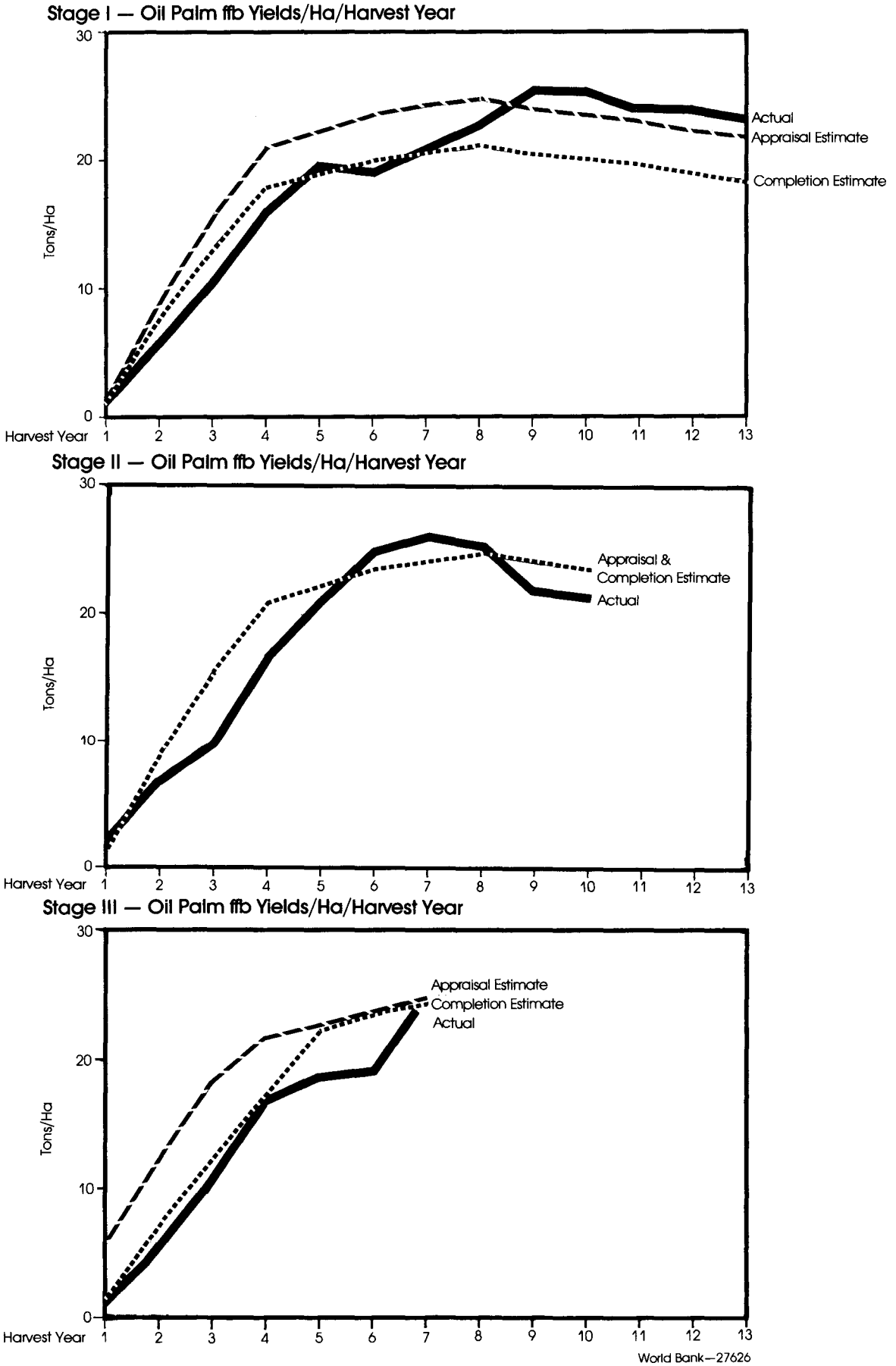
2.06 As the oldest schemes of Stage I have shown that yields are significantly higher after year 9 or 10, total FFB production is expected to increase in Stages II and III and to exceed projections made at completion. It is worth noting the project yields are close to those obtained in private estates and among the highest yields obtained in all Bank-supported oil palm projects.

6/ Agricultural production in all three projects has also been adversely affected in the early years when a number of seedlings were destroyed by animals, mostly elephants, after planting, requiring replacement during the following years.

MALAYSIA

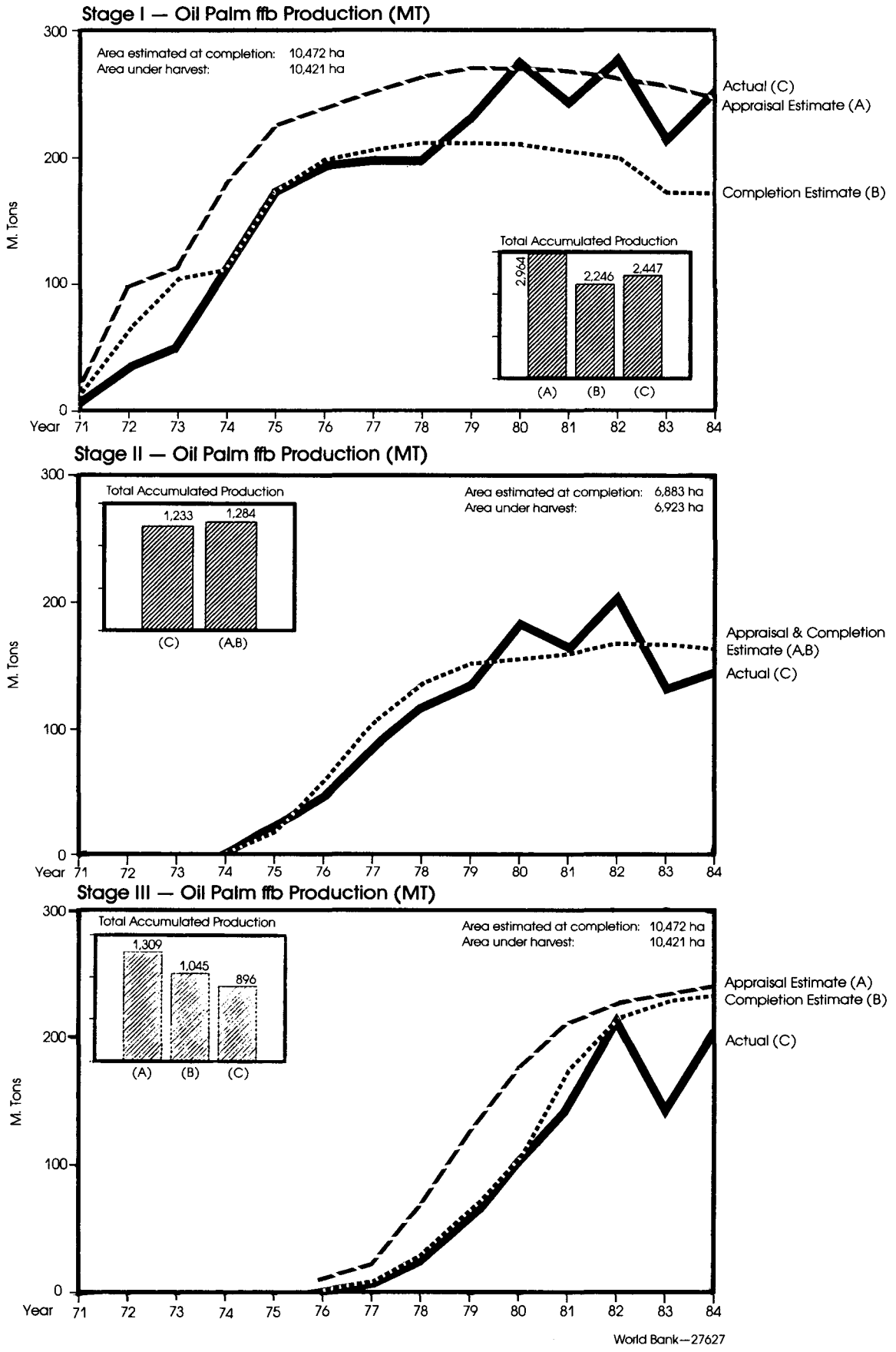
JENGKA TRIANGLE PROJECTS I, II & III

CHART 2.1



MALAYSIA
JENGKA TRIANGLE PROJECTS I, II & III

CHART 2.2



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2.07 Oil extraction rates for the past five years have averaged 18% compared with 19% estimated at completion and 22% estimated at appraisal, a shortfall of 10% and 19% respectively (see Annex 2.1). The lower than anticipated extraction rate is no longer attributed to mill management, which improved over time despite high staff turnover, but more to underripeness of fruits and water supply problems for some mills. As a result, while overall FFB production has been almost equivalent to projections, total oil production for the three Stages in the past 14 years amounted to 811,000 tons, or respectively 93% and 75% of completion and appraisal estimates (Chart 2.3). A gradual improvement of extraction rates has been noted however, and is expected to continue for the three new mills, which have now achieved a 18.5% extraction rate.

2.08 The extraction rate for kernel remained lower than estimated at completion (3.5%) up to 1980 and increased significantly thereafter up to 4.5% in 1984. (Annex 2.2). This increase in kernel production is attributed to better pollination following the introduction of the Cameroon weevil (Elaedobus Kamerunicus). Total production of kernel was estimated at 164,300 tons at the end of 1984, or about 99% of the revised completion projections (Chart 2.3).

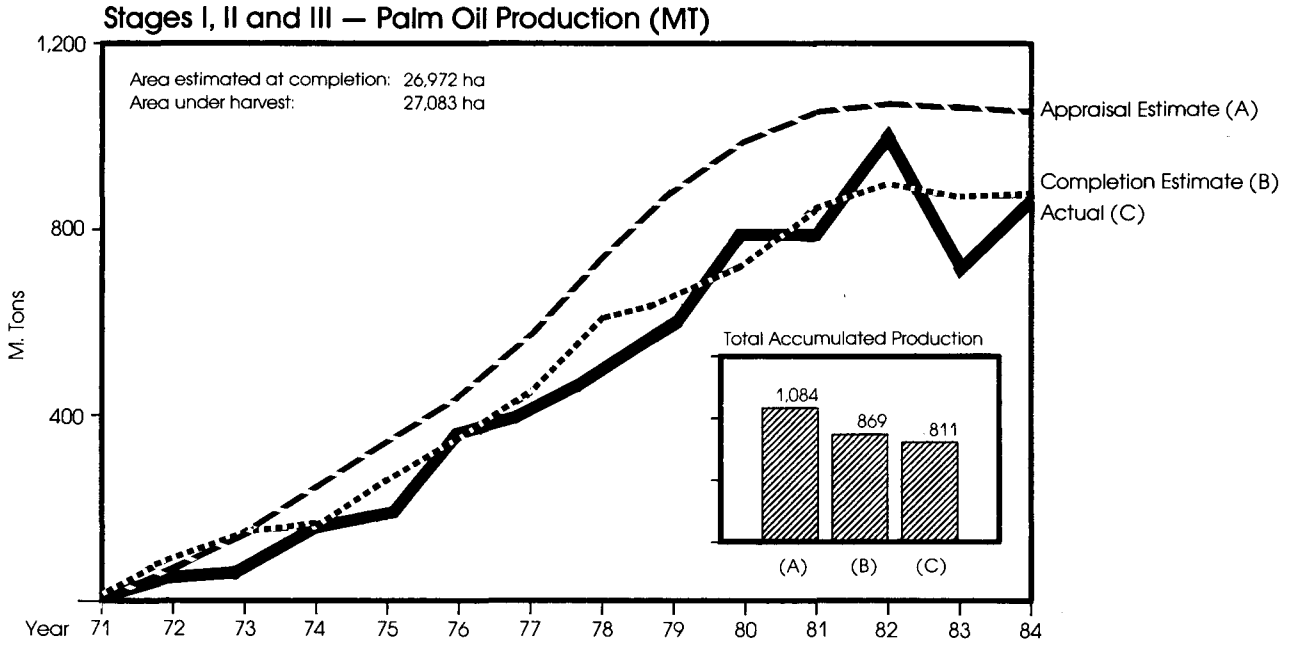
2.09 Due to higher FFB yields and lower production decline than anticipated at full maturity, and improving extraction rates of oil and kernel, total agricultural production of oil palm and kernel over the project life is expected to be equal or higher than expected at completion. The projects' good agricultural performance for oil palm can be attributed to three main reasons: first, the excellent climatic and soil conditions of the project area for oil palm undoubtedly result in high and steady FFB production. Second, FELDA has developed an excellent research and extension system which has resulted in rapid transfer to settlers of technological innovations. A good example is the FELDA Agricultural Services Corporation, operating commercially, which provides guidelines for fertilizer and pesticide application for each Jengka scheme, based on leaf and soil analysis, field observations and past trends. Another example is the quick introduction by FELDA of the Cameroon insect pollinator which had a beneficial impact on both yields and production costs. In addition, FELDA keeps close contact with international research organizations and is in the forefront of new technologies like cloning oil palm through tissue culture. Third, the integration of harvesting, transport and processing operations, a key element of success in the oil palm sector, has been adequately achieved. In this respect, much progress has been made since 1978, when the PPAR on the first project mentioned managerial deficiencies related to a lack of discipline in fruit collection, and timing and coordination of harvesting and transport to the mill.

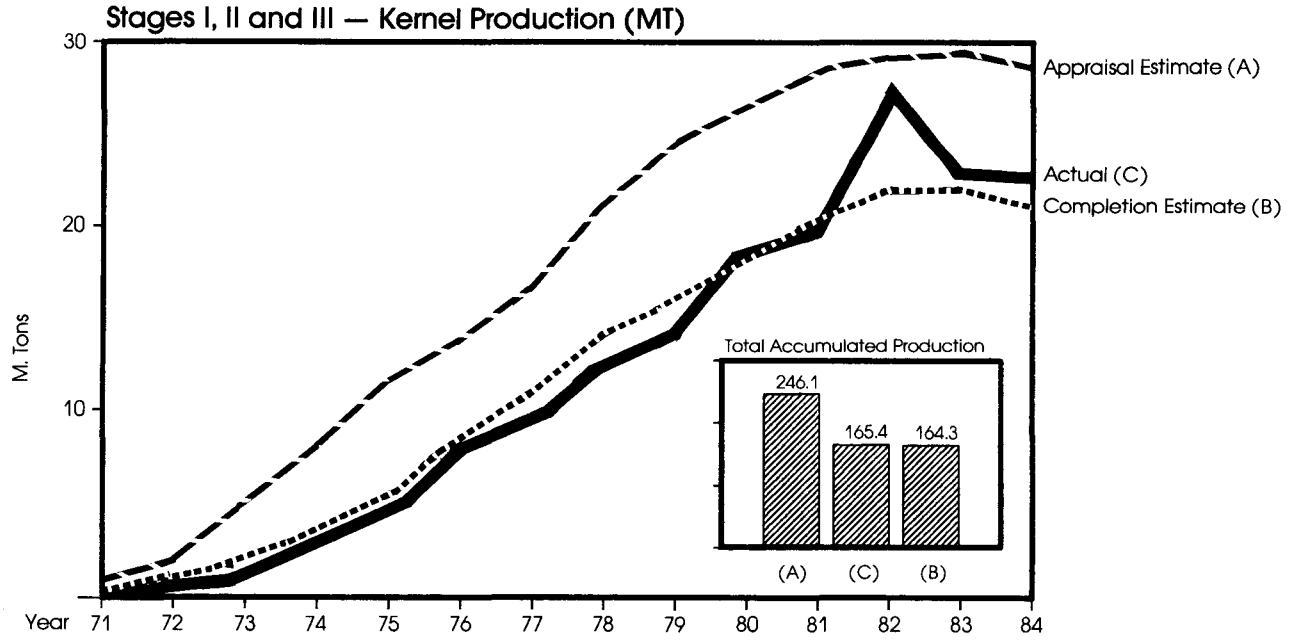
2. Rubber

2.10 As rubber has the potential to produce acceptable returns from soils of limited fertility, it has generally been planted in the steeper terrains and poorest soils of the Jengka Triangle. At project appraisal, rubber was considered particularly well suited for cultivation by smallholders, as rubber tapping provides year-round employment. Rubber processing facilities, including latex collecting centers and a central factory using the crumb

CHART 2.3

MALAYSIA
JENGKA TRIANGLE PROJECTS I, II & III





World Bank—27630

process[7]/ were constructed to serve the Jengka area. The quantity of latex produced depends on adequate fertilization of rubber trees, disease control and technical standards of tapping: cutting too deep or consuming excessive bark will cause damage to trees and reduce yields. Excessive tapping intensity may increase yields and incomes in the short run, but reduces both total yields and the economic life (25 tapping years or 32 planting years) of the trees in the long run. Settlers have been encouraged by FELDA to deliver fresh liquid latex that produces a better quality rubber, rather than cuplump. However, cuplump can be marketed easily (unlike the liquid latex) and settlers are inclined to sell cuplump to private traders, a practice considered illegal by FELDA, as it permits settlers to avoid repayment of their loans. This has encouraged close supervision of rubber settlers.

2.11 For the three projects, total production of rubber has been about 53,800 tons up to the end of 1984, compared with 82,900 tons projected at completion, a shortfall of about 35% (Chart 2.4). This difference can be attributed to smaller (14%) area planted to rubber, and to lower yields during the first harvest years than estimated at completion. There is strong evidence, however, that a part of the rubber production, estimated by FELDA at 10 to 15%, is sold to private traders and therefore is not accounted for in FELDA statistics. This is reinforced by the fact that some schemes have reached or exceeded expected yields and production while others have remained continuously below projections. However, as yields per hectare obtained in Jengka 7 (Chart 2.5) and 8, the two older schemes, are now higher than projected, comparing favorably with average yields (1,600 kg) of well-managed private estates and being much higher than those (880 kg) of many smallholders in Malaysia, annual production of rubber is expected to be equal or close to expectations within a few years.

2.12 Nevertheless, it must be concluded that the agricultural impact of the projects' rubber components has been unimpressive so far when compared with that of oil palm. It is worth noting that the three Bank appraisal reports did not follow the yields estimated in the regional master plan--with appraisal adopting a 23% higher figure, on the grounds that ethrel stimulant would be used by Jengka settlers. In fact ethrel is used, but wrong assumptions were made about the benefits of ethrel stimulation. FELDA is also facing problems with excessive and poor tapping techniques by settlers, while women tappers receive no systematic extension advice (para. 3.28). In addition, while FELDA is deeply involved in research and new technologies of oil palm, it is undoubtedly less engaged in the rubber research activities which are essentially carried out by RRIM and RISDA. Less tapping per year and high stimulation techniques, now successfully experienced in Malaysia and in some other countries, could constitute, if introduced in Jengka, a notable improvement of the rubber components.

7/ In the crumb process, both latex and scrap extracted from rubber trees are broken down into small granules before drying and packing. This process produces a rubber of high and even grade.

CHART 2.4

MALAYSIA
JENGKA TRIANGLE PROJECTS I, II & III

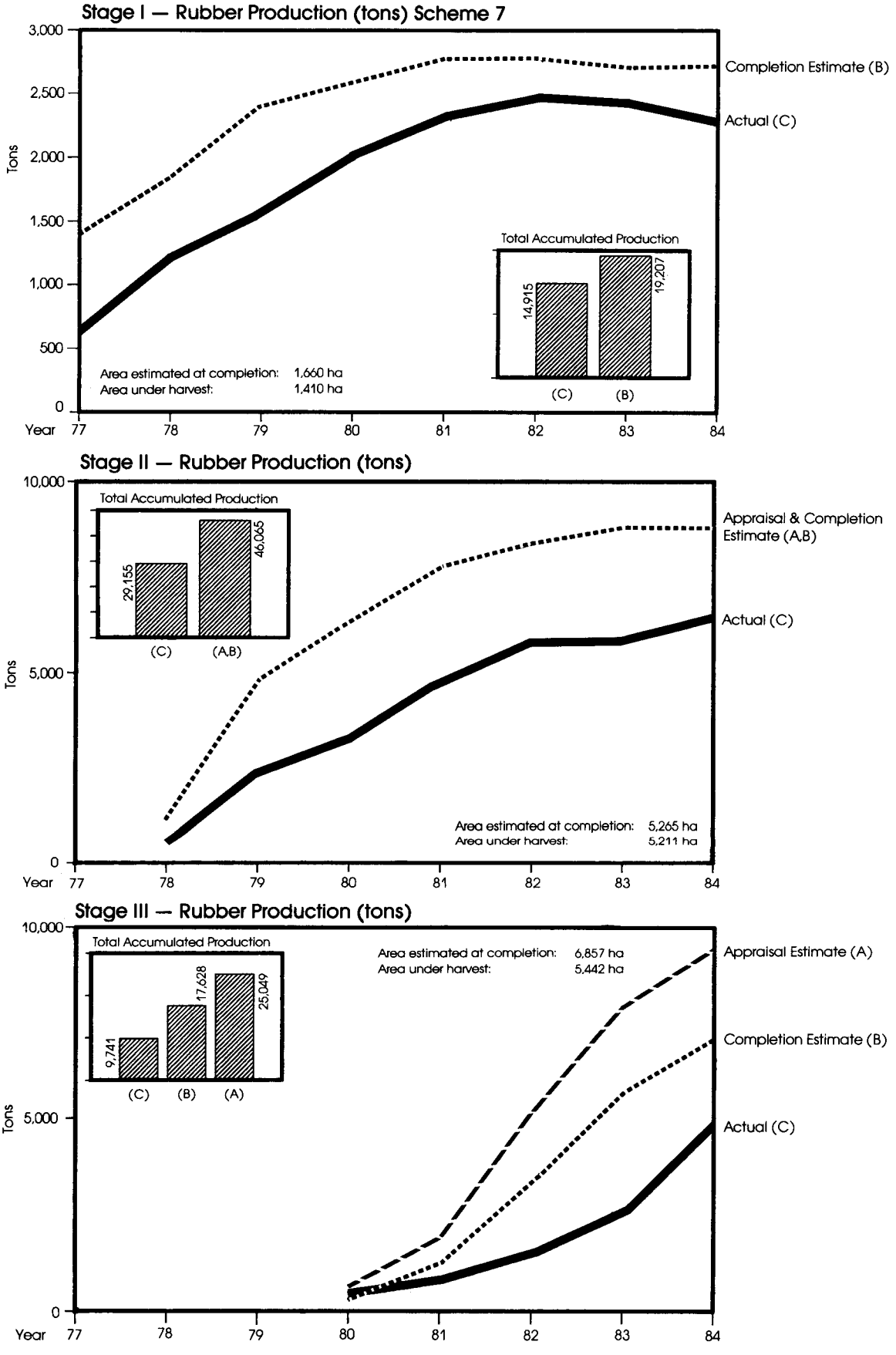


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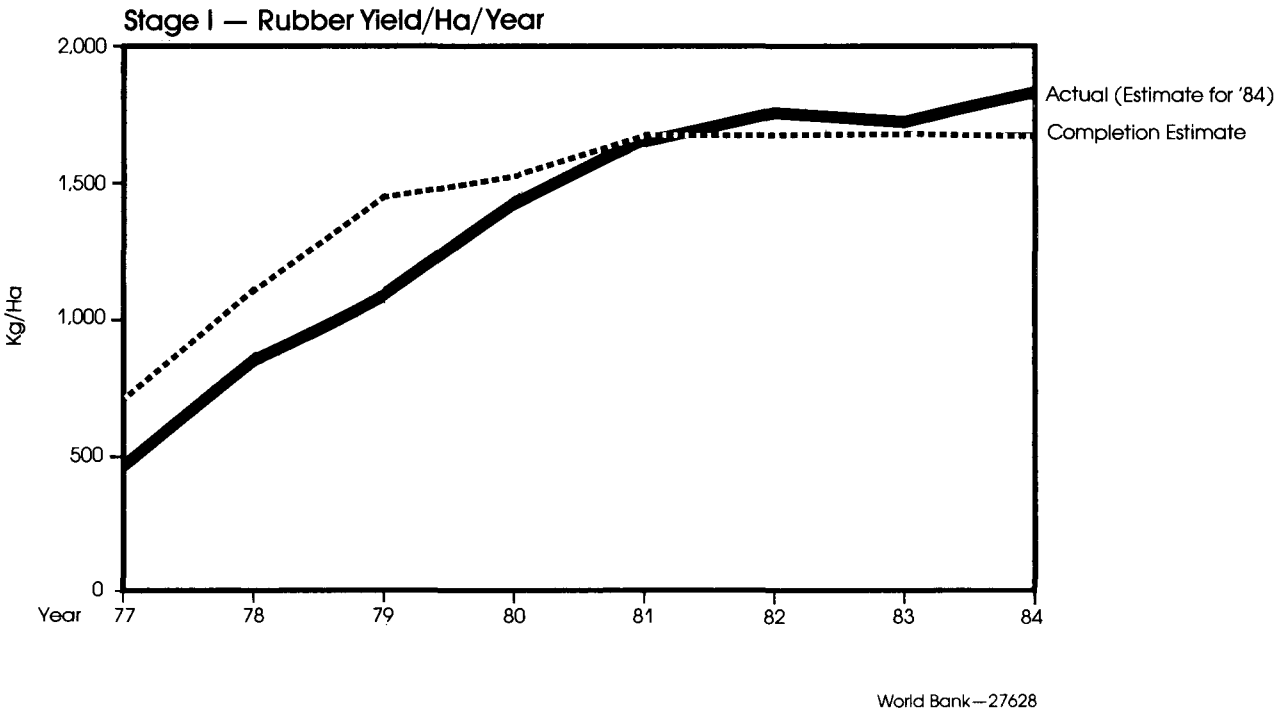
CHART 2.5

MALAYSIA
JENGKA TRIANGLE PROJECTS I, II & III



B. Economic Impact

2.13 The respective ERRs were calculated for each of the three projects in the completion years of 1978, 1980 and 1982. Production of and benefits from palm oil and rubber were reestimated on the basis of the then actual and projected yields and actual and forecast commodity prices. As a result, the projects' ERRs at completion were 35% higher overall than estimated at appraisal with yield shortfalls offset by improvements in the price of both oil palm and rubber. The revised ERR for the two rubber components varied from 15-17% above appraisal estimates while that for the three oil palm components was between 21-26% higher. At the time this impact evaluation was undertaken, the three projects' ERRs were again recalculated taking account of actual prices, yields, palm oil extraction rates and production costs.

2.14 Prices for palm oil fluctuated widely between 1963-84 (Annex 2.3) reflecting increases and shortfalls in production and exports of major fats and oils which, being readily interchangeable, have closely linked markets. Actual CIF oil palm prices in constant terms have fluctuated from US$790 in 1977 to US$500 in 1982 and US$660 in 1984, lower than estimated at completion of the first and third projects, and higher than estimated at completion of the second project (Chart 2.6).

2.15 In contrast, rubber prices have declined steadily over the period from US$300 per ton in 1960, in constant 1981 CIF prices, to about US$105 per ton in 1982 (Annex 2.4). Since then, prices, as shown in Chart 2.7, have fluctuated between US$100-170 per ton in constant prices, much lower than were estimated at completion of the first project, significantly higher than estimated at completion of the second, and about the same level as estimated at completion of the third.

Yields and Production

2.16 The project ERRs have been revised on the basis of actual and recently projected yields. For oil palm, as mentioned above, actual yields and production were lower than estimated at project completion in the first harvest years, but significantly higher thereafter; the palm oil extraction rate remains lower than anticipated. For rubber, where fewer schemes have reached maturity, it has been assumed that yields and production of the immature schemes will follow the trend of schemes 7 and 8 (para. 2.11).

Operating Costs

2.17 Comparison between operating costs at completion and at the impact evaluation stage is difficult, as details of these costs were not included in the PCRs. On the basis, however, of FELDA's estimates of the production costs of one ton of palm oil in 1985 (M$658.40), which includes management overhead costs, compared with the PPAR estimate in 1981 (M$375.90), operating costs have risen by 40% in real terms since project completion. This high increase is partly due to higher wages as a result of the tightening of the labor market following the most sustained commodity boom in Malaysia's history.

CHART 2.6

MALAYSIA
JENGKA TRIANGLE PROJECTS I, II & III

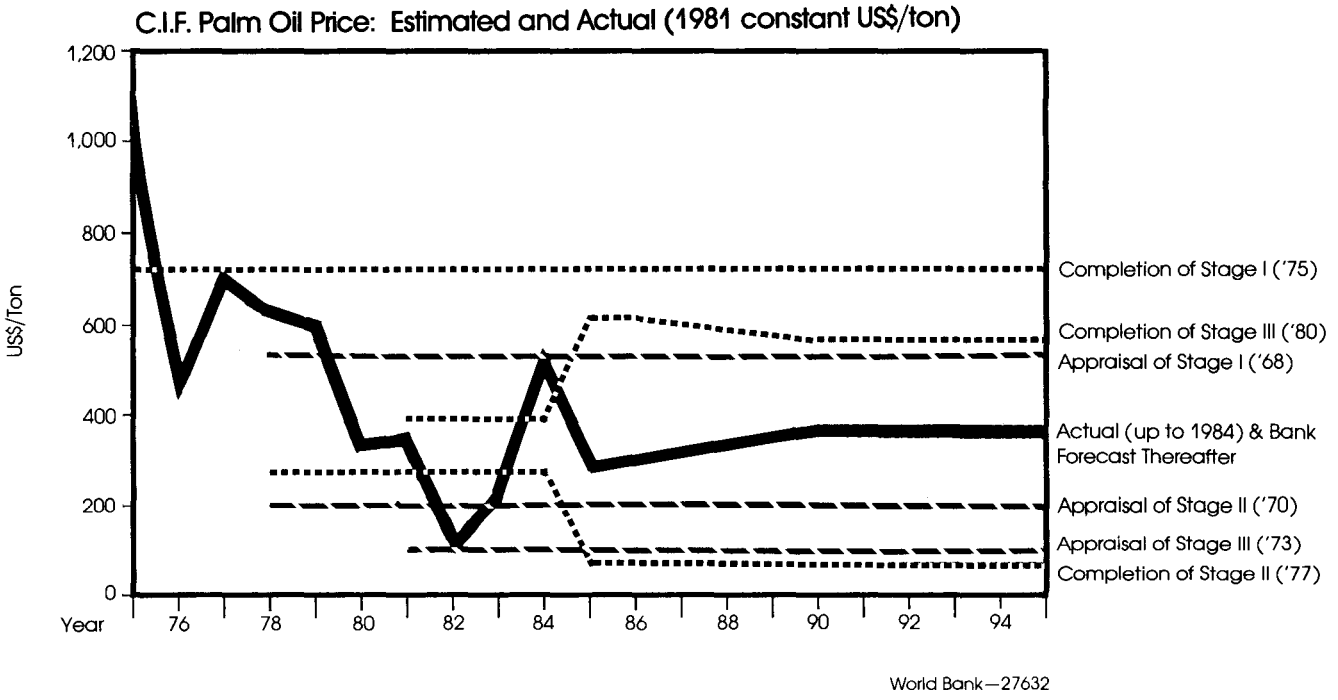
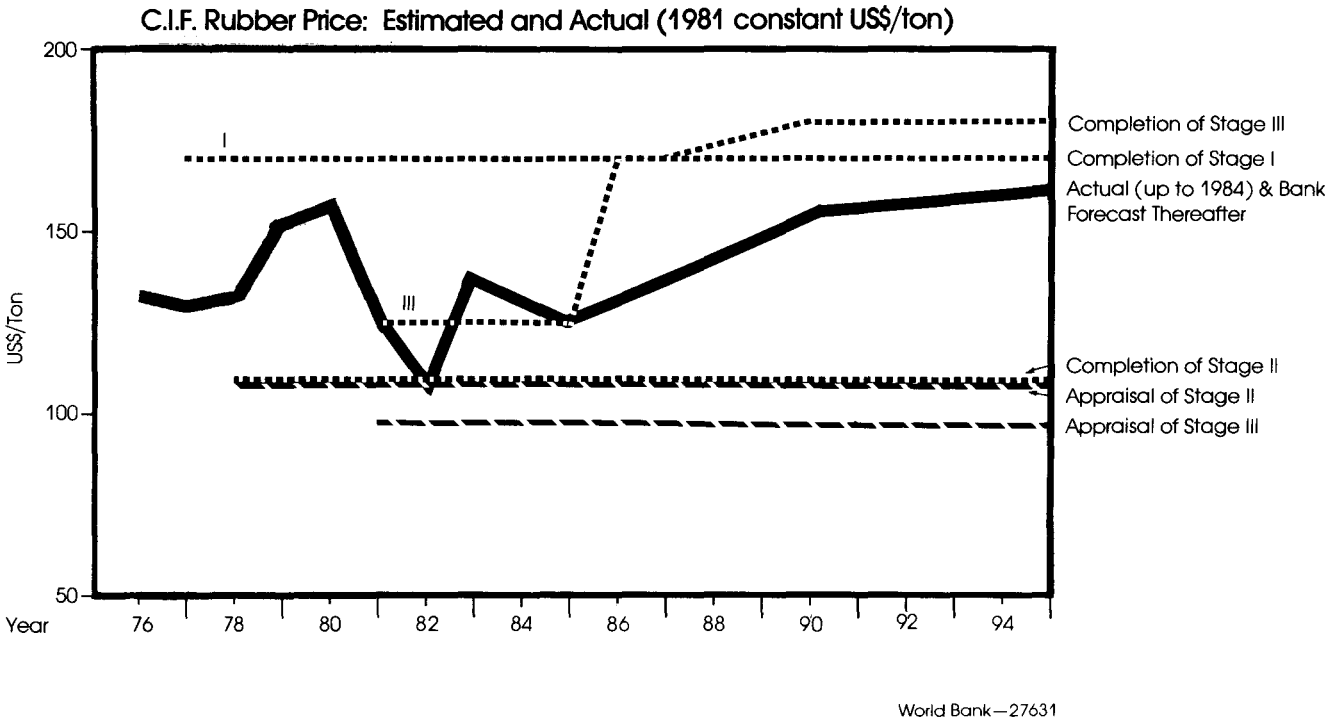


CHART 2.7

MALAYSIA
JENGKA TRIANGLE PROJECTS I, II & III



Reestimated Economic Rates of Return

2.18 On the basis of the above assumptions, ERRs have been reestimated as follows:

	% At appraisal	% At Completion	% Actual at Impact Evaluation
Stage I /a	16.0	21.0 (16.0)	16.0 (12.0)
Stage II: /b			
Oil Palm	18.3	23.4	23.0
Rubber	11.1	15.2	14.0
Stage III: /b			
Oil Palm	17.5	25.8	18.0
Rubber	12.5	16.8	12.0

/a Excluding schools, health and other social infrastructure. If included, the project ERR would be 16% at completion and 12% at impact evaluation.

/b Including schools, health and social infrastructure.

The analysis is moderately sensitive to variation in yield and price assumptions. For example, had the higher prices estimated at completion of Stage I prevailed, the ERR would have been 20% instead of 16%. Conversely if oil palm yields had been lower than they are, equivalent to those estimated at completion including a decline after the 8th harvest year, the ERR of Stage I would have been 13% instead of 16%. Including or excluding social infrastructure affects the projects' ERRs by 2-4%. The analysis is relatively sensitive to increases in operating cost: every 10% variation in operating cost affects the rate of return by about one percentage point. For the rubber component of Stage III, the estimated 12% ERR would fall to 11% and 10% respectively when revenue drops by 10% and 20%.

2.19 The analysis shows that:

(i) the three projects continue to exhibit a satisfactory rate of return;

(ii) oil palm has been and continues to be more profitable than rubber, which however, remains economically viable despite production and price lower than anticipated; and

(iii) the assumptions underlying the success of oil palm have reversed themselves with increased yields now making up the shortfall caused by lower than expected commodity price.

2.20 It is worth noting that secondary benefits have also been generated by commercial activities of settlers and settlers' wives (paras. 4.06-4.14). About 450 small business enterprises were reported in Jengka schemes in 1985. Other off-farm activities open to settlers are contracts with FELDA

(maintenance of roads or establishment of nurseries) and transport cooperatives. Although the economic returns of these secondary activities cannot be quantified for lack of data on their costs and benefits, it can be assumed that these activities have positively affected the economic impact of the projects.

III. SOCIAL IMPACT

3.01 The settlers are the nucleus of FELDA's program, being both the reason for, and the means of, development. In determining the extent to which FELDA has had some impact on poverty alleviation, this chapter first examines the selection system used by FELDA and the background of the settlers themselves. The settler survey (see Appendix) undertaken as part of this impact evaluation provides valuable insight into how the settlers regard their quality of life since joining the schemes; the constraints and opportunities facing women in the schemes; settlers' attitude towards their present and future status as FELDA settlers and what expectation they have for their children.

A. Settler Selection System

3.02 FELDA has developed certain guidelines for the selection of settlers for its schemes; particular preconditions are to be met and potential settlers are also evaluated according to certain criteria.

3.03 Over the period, both the preconditions and the criteria have been adapted by FELDA in response to changing socioeconomic conditions. When the system was first introduced in 1961, the preconditions required applicants to be Malaysian citizens; between the ages of 21-50 years, married and either landless or owning less than 1 hectare of farm land. Points were awarded to the settler and his wife for three criteria: degree of good health enjoyed; occupational background, with preference to farmers, fishermen and ex-servicemen; and family size--the more children the better. In 1969, the age requirements changed. The ceiling was lowered--to ensure that there was a reasonable chance that the twenty-year loan taken out by a settler would be repaid during his economically active life--but increased again in 1984 when settler demand for placement in FELDA schemes fell off partly due to the introduction of the shareholding system in place of land ownership. Over the period the criteria for selection have also been expanded. To the original three preconditions of health, occupational background and family size have been added education and special skills, e.g., in commercial or artisanal activities.

3.04 The background of the settlers in Jengka schemes shows that these preconditions and criteria have been met. Of the 229 settlers interviewed, 55% joined the schemes when they were the "ideal age" according to FELDA rules: between 21-30 years old. The gradual relaxation of the rules on age is reflected in Stage III where almost 10% of settlers are between the ages of 41-50 compared to only 1% in this age group for the previous two Stages,

(Annex 3.1). Of significance for poverty alleviation objectives is the fact that 72% of the settlers were landless when they joined the schemes--an incidence which increased rather than decreased over time with 66% of the settlers in Stage I being landless, but the percentage rising to 76% in Stage III. Settlers tended to be drawn from the rural areas: the majority were former rubber tappers (31%), padi farmers (25%), and oil palm plantation workers (6%) (Annex 3.1, Tables 2 and 3). Rubber and padi farmers are traditionally among the most disadvantaged people in rural Malaysia: in 1967 the average GDP per capita for Malaysia was M$1,000, in the rural areas M$500, and for padi and rubber smallholders between M$150-200. Educational attainment was below the norm for Malaysia, 68% of settlers and 55% of settlers' wives having accomplished 4-6 years of schooling whereas the number of children enrolled in primary schools as a percentage of age group in 1960 was 96.

3.05 From the survey it can be concluded that the settler selection system developed and implemented by FELDA has resulted in these new land development schemes providing an effective means for alleviating poverty in Malaysia.

B. Settler Identity

3.06 The survey reveals that settlers in Jengka trace their origin to all states of peninsular Malaysia. Seventy-five percent of settlers have been attracted from states other than Pahang (Annex 3.2). Almost all settlers are Malay rather than Chinese or Indian, and, for many, coming to Jengka was the first move away from the kampung of their birth, while very few have left the schemes over the seventeen year period.

3.07 The diverse background of settlers in Jengka is atypical of the situation in other FELDA schemes where over 90% of FELDA settlers tend to be from the same state as the scheme site. This reflects policies of the individual states which have responsibility for disposition of leasehold land. In the case of Jengka, located in the lightly populated Pahang state, the state government agreed to accept migrants from other states with the guarantee that, if demand warranted, a minimum of 50% of places would be allocated to Pahang natives.

3.08 Of the first 14 of the 23 schemes developed in Jengka which comprise Stages I and II, only three have 50% or more settlers drawn from Pahang state, the average being 30%. Moreover, in less than half of these 14 schemes did Pahang natives comprise the largest proportion of settlers by state. The states which have provided the greatest numbers are the land poor states of Kelantan, Kedah, Selangor, Perak and Malacca.

3.09 At appraisal of Stage I, it was expected that at least 50% of settlers would be of Malay origin, reflecting the ethnic diversity of Malaysia with its Malay/Chinese/Indian ratio of 53/35/9. At completion of the 14 schemes of Stages I and II there are only 6 settlers of Chinese origin and 46 of Indian origin; 99% of settlers are of Malay extraction. The higher than expected percentage of Malays reflects both that the rural population of Malaysia comprises 70% Malays, 17% Chinese and 11% Indians and the Government's policy to reduce poverty pockets, mostly consisting of Malays.

3.10 The survey shows that for many settlers, migrating to Jengka was the first time they had moved away from their state of birth: for 90% of settlers, the state of residence at the time of application to join the scheme was also their place of birth. Moreover, rural Malays have little experience in treecrops except in traditional rubber and labor in estates. The colonial government had encouraged Malays to cultivate padi; much of the labor for the private estates had been imported from India. Settler turnover is low: only 2% of settlers have left the schemes either voluntarily or have been expelled. Many clearly regard Jengka as their permanent home: only one quarter of all settlers surveyed undertook four or more trips to their state of origin in 1984 for social visits, festivals, etc. This is in contrast to experience in other land development schemes, notably Ivory Coast and Indonesia, where trips home are frequently made during the planting/harvesting of food crops.

3.11 The fact that FELDA was able to attract and retain large numbers of settlers from a variety of states at a time when mobility across state borders was not a frequently observed phenomenon leads to the conclusion that FELDA has exerted a strong pull effect. FELDA'S ability to meld peoples of diverse backgrounds to a point where the new scheme is regarded as a permanent home has clearly been helped by the fact that the overwhelming majority of settlers are Malay, which undoubtedly contributes to the cohesion of Jengka's population.

3.12 Farm households have a number of distinguishing characteristics. Average household size among the settlers surveyed is above the national average of 5 persons per household, with oil palm settlers having an average of 6.7 and rubber settlers less at 5.9 (Annex 3.3 Table 1). Heads of households are mostly male: 96.5% of those surveyed; women heads of households are mostly widows. In 1984, the average age of settlers was 44 years old, although this varies by scheme.

3.13 The higher than average family size raises the question as to whether this indicates triggered settlement,[8]/ phenomenon which has been observed in other Bank-assisted land settlement projects but the survey shows that families in Jengka consist of dependent children rather than relatives/ friends from home villages. Once the children finish their education, almost all leave the schemes. Although the schemes essentially comprise one economically active generation only, settlers interviewed said they would prefer their children to be living nearby but cited lack of off farm opportunities as a major reason why children emigrate from the schemes. The urban component envisaged at appraisal has not yet been developed (paras. 3.36-3.37). This outmigration has implications for future cultivation of the rubber or oil palm holding once the first generation of settlers has retired. The fact that settler families are larger than the national average suggests, however, that it is likely that one heir will be found from amongst each family to take over the holding.

8/ Whereby the resettlement of one family head results in other household heads from the same village/area being attracted to the new settlement scheme.

C. Social Infrastructure and Quality of Life

3.14 FELDA has continually emphasized production, but since the settler is both the reason for and the means of development, FELDA'S package extends beyond provision of technical supporting services necessary for increased production, and equal attention has been given to the settler. This has resulted in a striking degree of planning and control of settlers' day-to-day lives.

3.15 FELDA has designed its settlement schemes very much in the style of the traditional village, the kampung, with wooden houses built on stilts and surrounded by fruit trees. A 4-ha plot was settled because it was thought sufficient to ensure that each family would derive an income above the poverty line, yet still within the family labor availability; farm budgets were not built on the basis of using hired labor. In fact, FELDA considered the standard 4-ha plot insufficient to provide year-round employment for the settler and his family. Thus one-room houses were provided by FELDA so that when income levels increased, settlers would be occupied in expanding their house--plans for which were also provided by FELDA. Settlers are encouraged to plant flowers around their houses and vegetables on the household plot. Women receive visits from female social development assistants. FELDA has set up lines of credit whereby settlers may receive loans to engage in small business enterprises, has provided shops where settlers can purchase goods on credit, and has encouraged savings in FELDA downstream activities.

3.16 What then has been the settler reaction to the social infrastructure provided by FELDA and how has this benefitted FELDA in terms of contributing to its success in new lands development?

3.17 The survey shows that schools are considered the most important facility (Annex 3.4). Only the mosque receives a higher ranking than the primary school or kindergarten. Kindergartens were not part of the original plan, but strong settler demand led to their establishment. They are managed by the Scheme Development Committee (JKKR), partly financed by FELDA with classes being held in the community centers, which also serve as headquarters for the Women's Institutes and Youth Clubs, library and reading rooms. Settlers are also satisfied with the FELDA shop; its credit is particularly attractive to settlers and prices are reasonable. Profits are used to provide educational or welfare benefits to settlers, e.g. the kindergarten.

3.18 Services considered unsatisfactory by the settlers are, in ranking order, farm roads (over two-thirds dissatisfied), water supply (45%) and the environment (42%). The access roads within the schemes were far below settler expectations in both the wet and dry seasons. Some schemes reported that poor road conditions have led to delays in crop extraction to the detriment of palm oil yields. Dissatisfaction with the environment concerns the problems of water supply. Taps frequently run dry for several weeks during the dry season. Drinking water is transported by FELDA in lorries and rations are distributed to each household. Water available from streams for

domestic use is unpopular due to a perception by settlers that it is polluted either from effluent from the oil palm mills or from pesticide run off.[9]/

3.19 Settler initiative in providing social infrastructure has been confined to the small shops to be found in the schemes and, for some settlers, the provision of electricity. The privately owned eating shops are highly rated by settlers. Farm work for rubber tapping begins at dawn and breakfast will invariably be in the eating shops which sell hot and cold soft drinks, snacks and daily newspapers. Although the National Electricity Board has not yet linked the Jengka Triangle to the national grid, the better-off farmers have pooled resources with two or three neighbors to purchase a generator. Another frequently-used source of power is 12-volt car batteries, charged weekly at local shops.

3.20 In conclusion, the high ranking given to certain social facilities illustrates that provision of such services strengthens the attraction of new settlement schemes. The perceived advantages of such facilities can offset the lack of, or inadequate supply of, other social infrastructure, which, if deemed important enough can often be supplied by the settlers themselves after a period of years.

D. Settler Attitude Towards Current Status

3.21 There is strong settler satisfaction overall with their status as FELDA settlers, (Annex 3.5 Table 1). Ninety percent of oil palm settlers and 75% of the rubber settlers are satisfied with their status. Disparity in satisfaction between the two is essentially related to disparity in current income levels (para. 4.05).

3.22 In terms of how current status compares with settlers' expectations prior to joining the schemes, the conclusions are also positive. Settler expectations in respect of raising income levels, improving the quality of rural life, providing housing and health services have been adequately met for more than 70% of settlers. The degree of satisfaction varied again between oil palm and rubber settlers with the percentage of oil palm settlers expressing satisfaction tending to be 10% higher than those of rubber settlers, the margin being somewhat wider for that of raising levels of income. Only 64% of oil palm settlers and 55% of rubber settlers expressed satisfaction with job opportunities for their children.

3.23 Settlers were asked to name the three most important benefits in a FELDA scheme. Twelve benefits were grouped in three categories: (a) access to material goods, which included an improved house, vehicle ownership, household facilities such as a television; (b) access to services, including education of children, health services, clean water, roads, transportation and community centers; and (c) access to security, meaning future home

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9/ This aspect was investigated when analyzing the environmental impact of the projects, but in fact no evidence could be found in either respect (para. 6.10).

ownership, land title, guaranteed minimum income and non-agricultural job opportunities. Surprisingly, the most important benefit overall to the majority of settlers is the education of their children, next in importance is an improved house, followed by a guaranteed minimum income and fourth, future ownership of land (Annex 3.6). Compared to living in the traditional villages, FELDA schemes provide good educational facilities and assistance from kindergarten right up to tertiary education. There are also religious classes for both children and adults.

3.24 Improved housing is the second most important benefit, which is directly correlated to increased incomes. Sociological studies undertaken in rural Malay villages have shown that the first call on increased earnings in the event of periodic prosperity is the construction or expansion of the family's home, regarded as a major investment for the future. This tradition has continued in Jengka where settlers have renovated and enlarged their houses. To any visitor, the age of the schemes can be determined immediately by looking at the size and development of the houses. This is confirmed by the survey which reveals that in Stage I 83% of settlers have improved or renovated their houses; 78% in Stage II and 42% in Stage III (para. 4.16).

3.25 Higher income was considered the third most important benefit: settlers who had an average pre-project income of M$211 have increased their incomes by between 2.6- to 6-fold depending on the principal crop cultivated and the stage of scheme development (paras. 4.03-4.05). Future ownership of land has also proved an important attraction, not a surprising conclusion given that 72% of settlers were landless prior to joining the schemes.

3.26 In conclusion, settlers' expectations have been met and their status, in almost all cases, is fully satisfactory with the most important benefits being educational services and the security provided as a FELDA settler. Such an accomplishment must in part be due to FELDA's ability to identify what is important within the socio-cultural context of rural Malaysia.

E. Role of Women

3.27 Women settlers play a major role in the agricultural activities of rubber schemes in particular. Seventy-five percent of settler wives are engaged in rubber tapping (compared with 56% of oil palm settler wives engaged in harvesting of oil palm) spending 5-6 hours in the field each day. This percentage rises in the school holidays when older children are free to look after the infants. Forty-one percent of women also reported being engaged in maintenance activities. Women, therefore, constitute an important part of the workforce on rubber plots--where 88% of the rubber settlers (vs. 68% of oil palm settlers) relied entirely on family labor for completion of the farm work.

3.28 Despite this high proportion of women working on the rubber plot, FELDA's extension services provide advice on a systematic basis to male settlers only; women receive visits and advice only if specifically requested. Although social activities in the schemes are divided by sex,

women settlers reported that there would be no difficulty in their receiving extension visits from male extension officers. Women underwent training in tapping with much success in the Ivory Coast. A result of this differing level of involvement in agricultural activities is that women settlers in oil palm schemes have more time to engage in secondary economic activities. These tend to be home based, for example, sewing the traditional style muslim dresses. The survey confirmed that over one-half of settler wives have a sewing machine, ownership of which is regarded as a major ambition of settler wives. These activities rely on the market within Jengka itself. Secondary activities which are less self contained--for example small backyard poultry/livestock operations--have fared less well, reportedly because of the difficulties in developing marketing channels. Income from secondary economic activities fluctuates, but is not insignificant (paras. 4.06-4.14).

3.29 Women's involvement in the social activities in the schemes conforms to, and is organized in accordance with, Islamic principles reflecting overall management of the schemes, particularly at the settler level. FELDA has seen the common religious affiliation of its settlers as providing an underlying homogeneity to its new schemes. Consequently FELDA's social development officers responsible for supporting the JKKR and its subsidiary organizations are assigned on the basis of sex.[10/] Male officers deal only with "male" responsibilities such as the JKKR and mosque committee (women rarely attend the mosque) and female officers coordinate and support women's committees. There is no mixing of social activities between men and women. Participation of women in social activities in Jengka varies considerably between oil palm and rubber schemes with women in the rubber schemes having less time and being less often at home to receive visits. The striking division of social activity between male and female on the schemes with essentially no mechanism whereby men and women can convene to discuss matters of mutual interest, e.g., agricultural extension services, family planning, marital disputes, etc., has resulted in many of these matters being overlooked partly for lack of any constituency.

3.30 Women's rights under the FELDA system have been downplayed. Settlers cannot enter the scheme unless they are married, but the loan title is in the name of the husband only. In the event of divorce, or the husband taking a second or third wife, generally the first wife has to leave the scheme having no right or potential right to land title. FELDA has tried to address this by introducing a system whereby 50% of the amount of the loan already repaid is remitted to the divorced wife in monthly payments. This system has worked relatively well in the case of the oil palm schemes where loan recovery is about 96% but much less so in rubber schemes where the corresponding rate is in the region of 65%. Remittance of loan payments does not, however, address the issue of compensation for the land value.

10/ However, the Women's Institute is now represented in the scheme's JKKR where all matters including agricultural extension services, family planning and marital disputes are discussed. There are now 4 women representatives sitting in the settlers National Consultative Council, the highest level of JKKRs.

3.31 Of further concern is the fact that women's involvement in the labor force is not generally recognized in respect of earnings. Although women are heavily involved in rubber tapping, payment for the latex of cup-lump which they deliver to the collection centers is made to their husbands unless the women have express written permission enabling them to collect the proceeds of their work. Moreover, the traditional Islamic principles in respect of land inheritance, whereby all male and female siblings receive a share in the inheritance, are not applicable in FELDA schemes as the land cannot be split up for economic reasons; in almost all cases the land is assigned to the widow (para. 1.16). While FELDA is trying to establish a new community and not create a situation of radical social change, the survey also revealed that the majority of settler wives have achieved the same educational level as their husband.

3.32 In conclusion, because of higher average incomes from oil palm, wives of oil palm settlers have been more able to undertake economic activities of their own and to improve their status than rubber settlers wives. But despite an undeniable improvement of women's standard of living and educational level, the inconsistent application of Islamic principles in Jengka has probably served to erode women's rights overall when compared with those prevailing in the traditional kampung.

F. Future of Settler and Settler Family

3.33 A large majority of settlers wish to remain part of the FELDA system when their loans have been repaid and at the time of replanting, with a slightly higher proportion of rubber than oil palm settlers wishing to be independent of FELDA (Annex 3.7, Table 1). At the same time, settlers are also overwhelmingly against any change in their existing system of land ownership. Only 1.8% of settlers would rather become shareholders under the system that FELDA is now introducing as the basis of its new land development schemes (Annex 3.7, Table 2).

3.34 Settlers' aspirations for their children reflect the success of these schemes and the desire of parents to see their children progress beyond their own accomplishments. Forty percent of settlers would like their children to remain in the schemes either engaged in agricultural activities or in commerce. This is a surprisingly high figure, given the fact that the educational attainment of these children is also high, with over 80% having completed secondary education. The 60% of settlers who wish their children to leave the schemes illustrate, through their aspirations, their risk-averse nature: 51% would like their children to be government servants, reflecting the perceived advantages of job security, pensions, etc. Only 23% wish their children to enter private business and 2% to continue in farming (Annex 3.8).

3.35 A puzzling finding of this impact evaluation is that there have been so few multiplier effects within the Jengka Triangle. The survey shows that there is considerable settler demand for job opportunities within the schemes both for themselves (55% would like to go into business full or part time in the future) and for their children. At the same time there has been

a considerable demand for goods and services corresponding to rising incomes over a ten-year period. Yet development of secondary economic activities has been limited (paras. 4.12-4.14) and the urban development component has failed to become established as planned.

3.36 The regional master plan prepared in 1967 provided for urban development to complement rural development in the Jengka area. Three towns were proposed: Bandar Pusat in the center of the Triangle to serve a population of about 50,000 by 1975, and two smaller towns in the southeast and southwest of the Jengka area. In 1971, the regional development authority of Pahang state, responsible for urban development, undertook planning and began constructing basic infrastructure in Bandar Pusat. By 1983, however, the area remained in the initial stage of development while the two other towns existed only on paper. At the same time, unplanned spontaneous and dynamic development occurred in Tongkiaet on the edge of the Triangle. About 90% of these shops and businesses are owned by Chinese, most with previous business experience. The experience with urban development is succinctly summarized in a recent paper.[11/] Given that Jengka settlers are almost all Malay, this has had the effect of spreading some of the benefits arising out of the schemes to the rural Chinese.

3.37 Since 1983, responsibility for urban development in the Jengka area has been shifted from the state to the federal level since being taken over by the Jengka Development Corporation which reports to the Federal Ministry of Land and Regional Development. A budget has been allocated for the development of Bandar Pusat and new infrastructure and about 1,000 houses have been constructed. The population is now about 8,000, mostly civil servants and employees of a timber factory. Plans have been prepared to resettle within Bandar Pusat a number of illegal settlements which have grown up over the years and which are now to be destroyed. Tongkiaet shop and business owners are to be resettled in the two smaller towns since it is considered that if they were brought into Bandar Pusat the competition would be too strong for Malay traders. Training centers for mechanics, welders, etc., have been established. The question remains as to whether these efforts will finally permit the new town to emerge from its long lethargy.

3.38 In conclusion, the perception of a firm link with FELDA held by a majority of settlers illustrates the system's success. Equally clear is that the manner in which FELDA has created opportunities for this first generation of landless poor has caused problems for future prospects in that settlers want FELDA to continue management responsibility for the schemes even after loans have been fully repaid. At the same time, settlers are not prepared to relinquish land ownership in favor of becoming equity holders which is now an inherent part of any future FELDA management contract. Lack of job

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11/ "The failure of Bandar Pusat brings into focus the problems of artificiality of the urbanization programme" while "the success of Tongkiaet reflects the success of the Jengka Triangle and the potential for urban development in the rural settlement schemes," Land Development and Settlement in Malaysia, Tunku Shamsul Bahrin, p. 355.

opportunities for the children in the schemes has compounded the problem of future prospects in that the transition to the second generation will be less easily accomplished given that almost all children, whether they wish to or not, will have to spend a period of time outside of the schemes in gainful employment (since only 25% of settlers wish to retire in the immediate future) and thus are likely to find it difficult readjusting, both to farming and to FELDA's system of management control. The failure of the urban development component within Jengka may well be more associated with the fact that this was not a FELDA responsibility and FELDA had little control over its development or otherwise, but it may also be symptomatic of the difficulties inherent in trying to create new towns from scratch and the perhaps more workable alternative of encouraging and controlling the spontaneous urban development which does emerge.

IV. FINANCIAL IMPACT

4.01 The principal beneficiaries of the three projects are the settlers established in the Jengka Triangle. At the same time, FELDA, the state of Pahang and the Federal Government also obtain revenues from the projects through repayments of loans, payments for services, land taxes, replanting cesses, and export duties levied on production. This chapter analyzes the financial impact of the projects on all parties involved in the Jengka Triangle.

A. Settlers

4.02 Settlers derive incomes from various sources, the most important of which is the oil palm or rubber plot. Other sources of income are subsidiary activities which comprise: economic projects, household garden, dividends from investments and off-farm work.

1. Incomes from Oil Palm and Rubber Plot

4.03 Settlers receive a monthly payment for their delivery of FFB or rubber to the mill or collecting center. The gross income is calculated by deducting from the value of the FFB or rubber produced the cost of goods and services provided by or through FELDA (para. 4.20). The net income is derived after further deduction of the loan payment, land tax, quit rent, and replanting cess.

4.04 The following table shows yearly gross and net incomes received by oil palm and rubber settlers for the past three years. There is a large seasonal variation in monthly gross and net incomes. For oil palm, the highest net income is in November and the lowest in February, while for rubber, the highest income is in May and the lowest in September.

	1982		1983		1984	
Oil palm settlers	Gross	Net	Gross	Net	Gross	Net
	US$ equivalents					
Stage I	3,264	2,542	4,904	4,375	7,310	6,487
Stage II	4,777	3,527	4,694	3,808	6,035	5,102
Stage III	3,828	2,227	3,596	2,650	5,217	4,337
Rubber settlers						
Stage I	4,044	3,295	5,388	4,085	6,600	5,300
Stage II	3,025	2,299	3,622	2,608	4,705	3,500
Stage III	1,544	1,105	2,092	1,460	2,761	2,000

4.05 These figures illustrate:

(a) net incomes derived from planting at full production (Stage I) are 30% higher for oil palm settlers than for rubber settlers;

(b) incomes of both oil palm and rubber settlers are high--between 3- and 3.5-fold above the rural poverty level of US$289 equivalent per capita in 1982 for Stage I, and 2- to 2.7-fold for Stage II. For Stage III, incomes of some rubber settlers are still below the poverty level as three schemes started producing only in 1982;

(c) the difference between gross and net income is significantly larger for rubber settlers (US$1,078 on average for 1984, or 23% of their gross income) than for oil palm settlers (US$878 on average for the same year, or only 14% of their gross income). This difference is explained by the longer investment period and consequently higher investment cost and loan repayment for rubber cultivation;

(d) as many rubber schemes are not yet at full production in Jengka, the average annual income of rubber settlers in 1984 is about one-half the income of oil palm settlers;

(e) as labor requirements are significantly higher for the 4-ha rubber plot, (640 mandays/year) than for the 4-ha oil palm lot (360 mandays/year), the net return per manday is much better for oil palm (US$18 equivalent) than for rubber (US$8 equivalent) at full production.[12/]

12/ This difference could be considerably reduced if less days tapped and high stimulation techniques with lower labor requirements were introduced in Jengka (para. 2.12).

2. Incomes from Subsidiary Activities

4.06 The 4-ha oil palm or rubber plot in Jengka provides the family with year-round, but not full employment. Consequently, FELDA encourages the settlers to undertake off-farm work, and particularly to develop commercial activities. The settler survey revealed the following subsidiary activities.

4.07 Economic projects include the cultivation of fruit trees on vacant land as approved by FELDA, the rearing of livestock, aquaculture, etc. Work on economic projects was reported by 9.6% of the settlers, with yearly incomes equivalent to US$155 in 1985.

4.08 The household garden is the 0.1 ha of land surrounding the home. Most settlers cultivate fruits and vegetables in their gardens, but only 26% reported sales and the annual amount received is the equivalent of US$28.

4.09 Dividends from savings and investments in FELDA corporations and the National Trust Fund were reported by 100% of settlers, providing an average income of US$23 in 1984 (US$28 for oil palm settlers and US$12 for rubber settlers).

4.10 Incomes from off-farm work were reported by 22.3% of the households and constitute the major source of off-farm income. The percentage of settlers reporting off-farm work was about the same for both oil palm (21.9%) and rubber settlers (22.9%). Most were confined to the Jengka area (76% reporting), while a few of the oil palm settlers and sons worked outside the Jengka area (24%). The different types of off-farm activities and the proportion of settlers involved in these activities are the following:

Type of activity	% oil palm settlers	% rubber settlers	% all settlers
Inside Jengka			
Employed by FELDA	2.4	4.1	3.5
Public Service	4.8	2.0	3.0
Commercial Activities	6.2	3.4	4.4
Odd Jobs	4.8	4.1	4.4
Outside Jengka			
Agricultural Work	3.6	6.2	5.2
Non-agricultural Work	1.2	2.1	1.7
Total	23.0	21.9	22.3

4.11 In view of the importance of secondary economic activities as an indicator of multiplier effects which in turn are a reflection of the sustainability of the projects, the survey paid particular attention to this aspect. Commercial activities are encouraged by FELDA through a revolving fund to provide loans, shops for rental to settlers and business training

courses. 453 small businesses were reported in the 23 Jengka schemes, an average of about 20 per scheme (Annex 4.1). Commercial activities are limited to settlers, as outsiders are not allowed to operate businesses within the schemes. The most common types of business are provision shops and coffee shops, which constitute respectively 48% and 21% of all commercial activities. Motor repair, taxi, workshop, barber, tailor and small hardware enterprises account for the remaining 31%. Other commercial activities open to settlers are contracts with FELDA.

4.12 The settler survey showed that despite the high number of commercial activities in the Jengka Triangle, such activities provide low incomes. This has been confirmed by a case study of a general grocery shop which indicated a daily turnover of US$33-42, with a daily net profit of only US$8 (Annex 4.2). Commercial activities are not diversified, resulting in competition among settler businesses, mostly general stores and coffee shops, and to a lesser extent with FELDA shops. No construction and only a few repair workshops have developed although house improvements and motorization are widespread in Jengka and have been for the past decade. This seems to indicate a lack of activity and skills on the part of the settlers to develop such enterprises.

4.13 Tailoring and handcrafts represent a significant source of income for settler wives, mostly in oil palm schemes where women are less involved in field work than in rubber schemes. Some women interviewed reported incomes ranging from US$500 up to US$2,500 per year, although the monthly incomes fluctuate widely.

4.14 The net incomes of settlers from all sources in 1985 can be summarized in the following table.

Source of Incomes	Average income (US$)	%
Oil palm or rubber plot	5,252	94.1
Economic projects	11	0.2
Household garden	28	0.5
Dividends from investments	23	0.4
Off-farm employment	269	4.8
Total /a	5,583	100.0

/a Settler wives' incomes derived from tailoring and handcrafts cannot be estimated, as insufficient data are available.

These figures confirm that the agricultural activities provide the bulk of settlers' incomes. Despite the expressed wish of settlers for additional job opportunities for themselves and their children, settlers are not inclined to take off-farm jobs. With a fairly high income, many of them are attracted only by highly remunerative work and prefer to spend their non-working hours relaxing in their house.

3. Progress Indicators

4.15 The settler survey analyzed the extent to which increased incomes have been translated into improved living conditions for the settlers' families. Housing, household facilities, means of transportation and ownership of selected assets were reviewed.

4.16 Housing has been given high priority by settlers. The survey showed that over the last fifteen years since the first settlers arrived in Jengka, 66% of the settlers have completely rebuilt or extensively modified their homes, at an average cost of US$1,700 (Annex 4.3). Family labor and assistance from relatives provided most of the labor requirements with about one-third of the households using hired workers and contractors.

4.17 Household facilities have been considerably improved. Most houses (76.5%) have outdoor running water, and many settlers are extending the water supply to inside their houses. The original houses were not provided with electricity, but a third of the houses (40% for oil palm settlers and 20% for rubber settlers) now have access to private generators.

4.18 Transportation is important as settlers have to travel about 2 miles to their rubber and oil palm plot. Nearly all the settlers (95.2%) reported the use of motorcycles; 24% of the oil palm settlers and 13% of the rubber settlers own cars, not used for travel to work but for outings and leisure.

4.19 Annex 4.4 indicates the ownership of selected assets such as radio (79% settlers reporting), television (65%), electric fan (25%), lounge set (38%), etc. Of note is the ownership of a sewing machine, reported by more than half of the settler families.

B. FELDA

4.20 The value of all goods and services provided by or through FELDA to settlers is deducted at source from settlers' accounts. These goods and services consist principally of: agricultural inputs (fertilizer, pesticides, etc.), processing and transport of production. Costs of farm road maintenance, foliar analysis and technical advice provided by the research station are also recovered. FELDA also recovers from settlers their contribution to the settlers' development fund, crop insurance, and all advances and loans made by FELDA to individuals or groups of settlers.

4.21 FELDA staff in Jengka consist of 376 persons, an average of 16 per scheme. A typical scheme staff, which would be responsible for about 400 to 500 settler families, includes one scheme manager, 10 supervisors and extension agents and 5 support staff. All production statistics and settler accounts are kept at the scheme level and centralized in FELDA headquarters in Kuala Lumpur. Although insufficient data exist on FELDA's management costs at the scheme and headquarters levels, it can be assumed that part of FELDA's expenditures are recovered from the management levy, the remainder being financed from government budgetary allocations. FELDA enjoys a healthy financial position, as the following table shows:

FELDA: Statement of Income and Expenditure
(M$ million)

	Income	Expenditure	Excess of Income over Expenditure
1981	168.9	65.3	103.6
1982	188.2	75.5	113.0
1983	195.4	87.2	108.1

Other sources of income for FELDA are its return on investments in corporations and joint ventures and the spread on loans (para. 4.24).

C. State of Pahang

4.22 The state of Pahang recovers (a) an annual land premium equivalent to about US$24 per ha of oil palm or rubber and to US$1 for the household garden, and (b) quit rent, equivalent to about US$10 per ha of oil palm and rubber and to about US$3 for the settler house, another important source of state revenue. The revenues obtained by the state of Pahang from the Jengka Triangle amounted to about US$1.4 million in 1984.

D. Federal Government

4.23 Government revenues from Jengka consist of recovery of loans to settlers through FELDA, of replanting cess and of export duties on production.

1. Recovery of Loans

4.24 Scheme development was financed by loans from Government to FELDA. Government loans carry an interest-free grace period of five years, and another five-year period of repayments during which simple interest of 5.5% accrues. After this 10-year period, loans are repaid at a 5.5% compound rate during a 15-year period.[13/] Loans are on-lent by FELDA to settlers, who repay FELDA over 15 years at 6.25% compound interest, after a five-year grace period for oil palm and seven years for rubber. Loans are repaid by settlers through monthly deductions made by FELDA from their gross incomes (paras. 4.04-4.05).

4.25 For the 20 schemes now under production, the total amount to be recovered was originally M$169 million (US$73.6 million), corresponding to the cost of agricultural development, housing and houselot development as well as subsistance loans to settlers until harvest begins. The average loan per ha and per settler was equivalent to US$2,086 and US$8,344 respectively. However, as investment costs have increased over time and harvest starts later for rubber, the amount of the loan varies from one Stage to another and is much higher for rubber than for oil palm, as shown in the following table.

13/ These terms are equivalent to a loan with about 3.75% interest repayable over 25 years.

Average loan per ha and per settler
(US$)

	Oil palm		Rubber	
	per ha	per settler	per ha	per settler
Stage I	1,387	5,548	2,895	11,580
Stage II	1,631	6,524	2,944	11,776
Stage III	2,427	9,708	3,052	12,208
Average	1,815	8,647	2,967	11,854

In the same Stage and for the same crop, the loan also varies from one scheme to another, reflecting different investment costs.

4.26 In September 1984, the recovery of loans for each Stage and each crop was as follows:

Stage	Crop	Total Loan (US$m)	Repayment Due	%	Repaid	Repaid as % Repayment Due
I	Oil Palm	14.40	12.25	(85)	12.22	(100)
	Rubber	4.08	1.23	(29)	1.05	(85)
II	Oil Palm	11.29	6.10	(54)	6.10	(100)
	Rubber	15.30	4.38	(29)	2.50	(57)
III	Oil Palm	23.64	3.81	(17)	3.67	(96)
	Rubber *	4.80	1.39	(29)	0.76	(55)

* Scheme 16 only, as repayment is not yet due for schemes 20, 21 and 22.

The table shows that: (i) the loan recovery rate is excellent, and close to 100% for oil palm; (ii) loan repayment due to date for oil palm varies from 17% for Stage III to 85% for Stage I (with a maximum of 92% and 98% for Schemes 1 and 4); consequently full repayment for Stage I will be completed, and settlers will be given their land title, within three years; and (iii) for rubber, the loan recovery rate is significantly lower (55% to 85%) than for oil palm, reflecting low yields and low settler incomes during the first tapping years, and possibly illegal rubber sales in some schemes. Since the repayment due to date does not exceed 29% for any of the schemes under production, FELDA will probably have to expand the repayment period beyond the initially planned 15-year period.

4.27 Compared with a number of projects of this nature, the recovery of loans appears particularly good in Jengka projects. It is worth noting, however, that the subsidized interest rates and interest-free grace periods in effect result in about 60% of total development costs being recovered in constant terms.

2. Replanting and Research Cess

4.28 A replanting cess equivalent to US$75 and US$43 for rubber and oil palm respectively is deducted from settlers' gross incomes at full production. While the replanting cess for rubber has been in existence since 1952, that of oil palm was recently introduced. Payment of the replanting cess will permit settlers to benefit from government grants when aging stands have to be replaced. Rubber settlers also pay a research cess of M$0.0385 per kg.

3. Export Duty

4.29 Export duty is the major source of revenue for the Government. Above a certain floor price, export duty is levied which is progressive and calculated according to gazetted FOB prices of palm oil and rubber. When the average export duty for crude oil palm was M$134 per ton in 1983 and M$556 per ton in 1984 (due to increase in price), Jengka palm oil production contributed to the government exchequer M$36 million per year (US$15.6 million) on average. In other terms, the government revenue from oil palm generated by Jengka was about US$576 per ha per year on average for the past two years, the equivalent of about 43% of the settlers' net incomes or 27% of the gross revenue of the holding. For rubber, export duty is currently payable only when FOB price is above 180 Malaysian cents/kg. As prices have seldom risen above this limit during the past two years, the rubber export duty generated by Jengka has probably been small. Nevertheless, the overall revenues derived by Government from Jengka largely exceed the amount of subsidies on agricultural investments (para. 4.27) and of Government's contribution to FELDA's operating costs.

4.30 In conclusion, the financial impact of the projects has undoubtedly been positive for all parties involved in Jengka. Settlers have considerably improved their living standards, although the income disparity between oil palm and rubber settlers is notable. Given current international prices, this disparity, which will decrease to some extent when rubber schemes reach full production, is likely to remain a constant feature of Jengka, as returns per ha and per manday from oil palm are, and will be in the foreseeable future, higher than for rubber. Despite high income levels and high demand for consumption goods, subsidiary activities have been less important than expected; contribute only marginally to employment of settler family members; and have intrinsic limitations within the essentially rural environment of Jengka (para. 3.35 et seq.). The projects have had a favorable financial impact on FELDA, the state of Pahang and more particularly on the Federal Government, which was able to capture a substantial part of the project revenues. The above analysis shows that the financial success of the projects is mostly due to oil palm, the "golden crop" of Malaysia.

V. INSTITUTIONAL IMPACT

5.01 Previous chapters have illustrated one of the major findings of this impact evaluation report: that much of the economic, social and financial sustainability of these three projects is directly attributed to

institutional effectiveness. Measuring accomplishments in institution building and isolating the reasons underlying its development is difficult within the confines of a single five- to seven-year project since the process itself is intrinsically a longer-term undertaking. Consequently, the seventeen-year span covered by this impact evaluation offers a unique perspective from which to isolate the extent of institutional effectiveness over the period, the manner in which it has been accomplished and the reasons behind such effectiveness. The contribution of the Bank is also examined.

A. Extent of Institutional Effectiveness

5.02 Over a period of about twenty-five years, FELDA has grown into one of the most successful land settlement organizations in the world, an achievement which gains in importance when it is recalled that FELDA is a state-owned enterprise. This record has been accomplished without recourse to protected markets or monopolies. FELDA has always competed with the private sector and has demonstrated that it can produce an equally satisfactory performance--this at a time when parastatals are often viewed as organizations with poor operating performance, a low or non existent capacity to recover costs and/or generate self financing, which usually results in rising debt and a concurrent heavy burden on government account.[14]/ FELDA stands, therefore, as a clear example that publicly funded agencies can be efficient users of resources and can play an important role in poverty alleviation, a mantle rarely assumed by the private sector. Although the development of the Jengka Triangle represents only a small portion of FELDA's total operations (about 40,000 ha out of about 600,000 ha developed overall), the 17-year period together with the fact that it was FELDA's first major undertaking and a prototype for subsequent large-scale regional land development, combines to provide a suitable context within which FELDA's institutional effectiveness can be analysed.

5.03 Institutional effectiveness is much less pronounced at the settler level. Settler self management, which is a vital ingredient to continuation of project success in the future, can only be described as in embryonic form. Although settler participation in scheme based associations is high, the types of decisions entrusted to these organizations remain largely procedural rather than substantive. Responsibility for the latter continues to rest with FELDA with the consent of the settlers themselves. After fifteen years in the FELDA schemes, settlers tend to see themselves as the junior members of FELDA's family carrying little responsibility for scheme management overall. This raises the question as to whether and to what extent FELDA's management style, which has contributed to successful project implementation, has precluded settler initiative which is the nucleus of the longer-term sustainability of project benefits.

14/ "Managing State Owned Enterprises" M. Shirley, SWP No. 577.

B. How Institutional Effectiveness has been Achieved

5.04 FELDA's approach covers two distinct aspects. First, it has developed an overall plan, one which is innovative: essentially combining the strengths of smallholder agriculture with those of the estates. Second, this plan has been systematically carried out in a manner in which risks have been minimized. Thus, the monitoring of performance has been undertaken by a system of management hierarchy rather than settler self supervision and control.

5.05 Drawing on the advantages characterizing smallholder agriculture, FELDA has sought: (a) equality of treatment generally found in the rural areas, for example, the opportunity to participate in decision making through the medium of village associations and (b) ownership of productive resources. Management of the Jengka schemes is a FELDA, not settler, responsibility, but at the same time FELDA has encouraged the formation of settler associations whose objective is to encourage decision making at the local level and to take over responsibility for scheme management, particularly in the period following loan recovery when title has been passed to the settlers. To achieve this, FELDA has laid particular emphasis on two types of settler management in particular. First, the establishment of the Scheme Development Committee (JKKR). This is chaired by the scheme manager and includes representatives from the settlers, FELDA, and various government agencies. The JKKR is modeled on the village development committee originally established by Government for security purposes and responsible for establishing local development priorities, forwarding project proposals to the district offices and implementing such projects. The committee comprises the village headman, officials from the local school and mosque as well as from relevant government departments, reflecting FELDA's policy of developing its settlement schemes following the same size, structure and organization as in the traditional Malay villages.

5.06 The second means by which settlers are to be involved in scheme management is the oil palm block system. FELDA requires that each block select a leader from among the 20 settlers to be responsible for organizing work within the block and for coordinating activities with other blocks in the scheme. By incorporating ownership of land, FELDA has sought to overcome one of the principal constraints in the rural sector--subeconomic size of landholdings. FELDA has in turn benefitted from being charged with developing new lands, as it is unhampered by the complex land tenure issues which confront other agencies charged with in situ development. The impact evaluation for Muda and Kemubu found that the existing land tenure system is such that if the vital ingredient on which a new technology is based is land, development arising out of the introduction of technological innovation will result in patterns of income distribution widening and existing income inequalities being reinforced. FELDA, in being able to allocate a 4-ha plot to settlers, sought to satisfy aspirations of many of the landless poor while also avoiding the potential problems of ever-widening income disparities.

5.07 At the same time, FELDA has adopted from the estates sector the priority given to production in which technology is applied using specialized and highly developed techniques of management which has the effect of turning

crop production into a system resembling an industrial process: (a) the use of a detailed routine in which each tree is tended regularly and with the same treatment; (b) incorporating the best known technological practices, which requires links with international research to ensure that the techniques are constantly being improved or updated; and (c) links with commercial and marketing opportunities, which in turn requires attention to grading and processing.

5.08 The second aspect of the FELDA approach has been to implement its plan using a system in which almost all risks have been minimized. Risks have been minimized first in respect of the settler. FELDA's policy is to provide the settler with the maximum of support during the early years to help the settler overcome initial adaptation problems including the need to learn new skills and a daily routine. Risks have also been minimized in respect of production and yields in that FELDA, as far as is possible, controls all factors in the production process, beginning with the quality of the planting material right through to the marketing of the final product. After the early years, FELDA abandoned the idea of settler self help. Work organization at the farm level is the responsibility of settlers but is closely supervised. FELDA introduced the block system[15/] for agricultural management of oil palm cultivation essentially because first, modern cultural practices are more complex than for rubber while oil palm at that time was a relatively new crop for smallholders and it was considered easier to teach farmers on a group basis. Second, farming practices such as weeding, fertilizer application, and pollination are better supervised and considered to be more efficiently carried out when the work is done in a group. Third, oil palm mills demand a strict timetable of coordinated harvesting and transportation operations, made more necessary by the wide fluctuations in production from month to month.

5.09 FELDA has not organized agricultural operations for rubber on a group farming basis. From the beginning, rubber settlers in Jengka were allocated an individual plot, as the crop does not require a strict harvesting timetable. Thus the transfer of technology to rubber smallholders has been more the improvement of existing cultivation practices and harvesting techniques rather than the introduction of a new crop. Consequently, there is less need to coordinate and group agricultural activities as in the case of the oil palm. The design of these land settlement projects lends itself to efficient research extension services. FELDA is also responsible for the processing, refining and export of the end products.

15/ This is an example of successful features of FELDA's system being diffused into national programs: government extension programs throughout Malaysia are now actively promoting mini-estates or group farming particularly for smallholder oil palm, cocoa and padi which are essentially based on this concept promoted by FELDA, and intended to both overcome small and fragmented landholdings and secure better management.

5.10 Finally, FELDA has taken care to reduce its own financial risks by linking future land ownership to recovery of the loan amount--only when full repayment has been secured will leasehold title pass to the settlers.

C. Limitations to Institutional Effectiveness

5.11 FELDA's approach has limitations, however, most particularly in the lack of settler institutional effectiveness affected by the risk minimization strategy. Settler self management can be gauged by settlers' perception of where responsibility should lie: with the settlers themselves or with FELDA. Indications of this are settler views of the respective roles of the scheme associations, since all were originally established by FELDA; the degree of settler participation; the nature of the decisions entrusted to these organizations and settlers' perception of FELDA.

5.12 Throughout the rural areas, JKKRs tend to be regarded as government rather than village institutions but nearly 70% of settlers surveyed in Jengka stated that they regarded the JKKR as a settler organization, (Annex 5.1). Moreover, participation in the JKKR is the most active of all the eight settler associations--88% of settler households reporting (Annex 5.2). In terms of the degree of responsibilty held by the JKKR, as measured by the types of decisions made, however, the JKKR has a much reduced managerial role when compared with FELDA. Typical duties involve: calling for tenders for certain agricultural tasks; preparation of a nursery or improvement and repairs to farm roads; expressing settlers' views and suggestions and organizing social activities. For important decisions, for example, regarding the time for replanting, utilization of waste land, or use of funds from settler savings, over 50% of settlers prefer the decision to be taken by FELDA. Only 12% felt this should be a settler responsibility (Annex 5.1, Table 3).

5.13 At the agricultural working level, particularly in the block system for oil palm, the settlers assume more responsibility. FELDA outlines the overall agricultural program for each of the schemes and the blocks within each scheme; the block leader then prepares a monthly program of work which is discussed with members of the block. In 76% of cases, the work program is then endorsed after general consensus has been reached; in 15% of instances it is the block leader who finally decides the program, while in 8% of cases it is FELDA which decides (Annex 5.1, Table 3). Although the block system was designed as a cooperative organization, whereby the group of 20 settlers were supposed to work collectively within the block, there is, in practice, great flexibility. According to the results of the survey (Annex 5.3) for more than 85% of the settlers the working pattern is individual and members of the block are responsible for completing the various activities within the agreed timetable. In the event of the work being unsatisfactory, the block leader can request the work be redone. If still not satisfactory, the block leader may impose a penalty and also engage hired labor to complete the task, the cost of which is then deducted from the settler's revenues. FELDA management staff undertake monthly inspections to ensure that a satisfactory standard of work prevails. Payment to settlers from the proceeds of the FFBs varies from block to block. In some instances wage payments are

made for different tasks and the balance is divided equally amongst all members of the block. In other cases, where the field work is mainly individual, the receipts from the produce are equally shared--a feature which recognizes that soils vary throughout the block and some settlers have access to better land than others. In conclusion, therefore, it is evident that field organization is a mixture of block and individual work with the allocation between the two largely being determined by the settlers themselves. It is worth noting that the block system, despite its apparent constraints, has been found by the survey to be satisfactory for 88% of the oil palm settlers (Annex 5.3, Table 4).

5.14 Other settler associations, functional in nature, which have social rather than income generating objectives have high participation rates. FELDA notes that since 1973 a total of 23 settlers' cooperatives were established in the Jengka complex with a total paid-up capital of M$2.64 million, dealing in the transportation of oil palm FFBs. The survey reveals that participation in the parent-teacher association, the women's institute and the cooperatives is high--each about 75%. Less active is involvement in the community center, youth brigade and mosque committee--about 50% each, while the political organization attracts the lowest at 42%. At the same time, these associations have been heavily supported by FELDA through its provision of staff, usually in an executive capacity, for their day-to-day administration. Overall, participation by oil palm settlers in all associations is higher than those of the rubber settlers, probably explained in large part by the fact that the agricultural activities are less demanding in terms of labor requirements. Although oil palm settlers are more active, the settler survey shows that these settlers are more dependent on FELDA than are the rubber settlers. Over 50% of oil palm settlers regarded FELDA as a father figure, rather than as a technical adviser or employer whereas a lesser percentage of rubber settlers (38%) regarded FELDA in this light. Moreover, only 18% of oil palm settlers have a clear idea how their incomes are computed, while 40% have no idea at all how these are constructed. Twenty-eight percent of rubber settlers understand clearly how their incomes are derived. Eighty-three percent of oil palm settlers want FELDA to continue once their loan repayments have been made--63% of rubber settlers wish to remain in the FELDA system, (Annex 5.4). Finally, 90% of the oil palm settlers and 76% of the rubber settlers are satisfied with their current status as FELDA settlers. Only about 8% of oil palm settlers and 5% of rubber settlers perceive FELDA's control on their daily activities as too strong.

5.15 This limited acceptance of responsibility raises the question as to the extent to which training has been used to stimulate/develop settler interest in scheme management. FELDA has a formal training program which complements the phasing of the schemes themselves. First, orientation courses are intended to acquaint newly arrived settlers with FELDA's policies and programs and with individual settler responsibilities. Next, technical courses deal either with aspects of farm management, for example in financial control, or with the agricultural aspects of palm/rubber cultivation. Finally, leadership courses are expected to foster a sense of self-management and prepare settlers to take over running the schemes. Attendance at these

courses was reported by settlers to be high for the orientation programs, but rather less so for the technical or leadership courses (Annex 5.5).

5.16 It is evident, therefore, that institutional effectiveness is clearly demonstrated in the sense that FELDA has developed into an efficient organization able to sustain operations. What is also evident is that despite the existence of a range of settler associations with high participation rates, the settlers are still lagging behind in exhibiting managerial capacity, except where this enables them to work individually in their plots. This brings into question the outlook for future prospects of these schemes. The fact that 87% of settlers report that they are happy with the degree of control exerted by FELDA over their daily lives indicates the downside risks to FELDA's approach in that the settlers appear to have become more, not less, dependent on the system over time. The consequences of such lack of self management at the scheme level is that scarce human and capital resources continue to be tied up and are not available to create opportunities for the remaining rural poor in Malaysia (para. 7.18).

D. Reasons for Institutional Effectiveness

5.17 The reasons underlying FELDA's effective project design and implementation can be attributed in part to the supportive environment in which it operates, i.e., factors external to FELDA, and in part to internal management practices. External factors essentially cover two aspects. First, supportive government policies. Although FELDA has multiple objectives reflecting that as a state-owned enterprise it has both social and commercial goals, the priority among these objectives has always been clearly defined by Government. Production has been accorded the first priority. FELDA was not expected to substitute for the private estates but to operate in parallel with them. As a result, although the Government has chosen not to use profits to measure FELDA's operating performance, accountability is determined by achievements of annual targets for land development and settlement, as laid down by Government.

5.18 In addition to clear-cut goals, FELDA has been given sufficient autonomy. This was evident right from the early years when FELDA, because of the close links between its senior management and the federal executive, was able to experiment with various alternative land settlement approaches free from political interference. The Government has been careful to ensure that the proceeds from the development of this high-value crop which have proved to be of benefit to all parties alike (Chapter 4) have continued to benefit all parties. Thus, while Government has reaped substantial economic benefits from these projects, it has generally exercised fiscal restraint. Although taxes on rubber are known to be higher in general than for oil palm, producers have not been penalized by excessively high export taxes as has been the case in many other countries where high-value crops have been regarded as a useful source of government revenue. The importance of clear-cut objectives as between the role of Government and the parastatal enterprise to the latter's good operating performance is a factor which has been noted in the Bank's analysis of state-owned enterprises.

5.19 A second external factor explaining FELDA's success has been the existence of private oil palm and rubber estates in Malaysia. These have served as a catalyst in that their presence in the market has acted as a challenge to FELDA. Other benefits have been more tangible. Some staff have been recruited from the estates sector. FELDA has not hesitated to use the private sector for short-term management contracts as needed. FELDA has also followed the practice of the larger estates which have provided an effective channel between developments from international research findings in oil palm research stations in West Africa, for example, and their use and adaptation to Malaysian conditions.[16]/

5.20 There are several factors internal to FELDA which in large part also explain its institutional strength. First and most important, the crop lends itself to fully integrated operations, providing FELDA with justification for a hierarchical system of management. As has been pointed out elsewhere,[17]/ for an institution to be successful, where it does not control all the resources for successful project outcome, it must at least appreciate the role that other actors play within the environment in which it operates in order to be able to influence these key actors. It is evident to this impact evaluation that FELDA has fared better where it can exert outright control; when it has been necessary to influence other agencies/settlers this has been less successful, a finding noticeable not only in respect of rubber smallholders vis- -vis oil palm. The implications, however, are that by relying on a system of control, such an approach may be ultimately self defeating. The demonstrated economic/agricultural success argues in favor of continuation of the system but at the same time this approach can foster passivity and dependence amongst settlers which precludes development of the necessary self-management.

5.21 A second internal factor which can be attributed to FELDA's performance has been the style of management. It has had a leadership with clear-cut goals, which has developed a long-term strategic plan and has been able to attract and retain staff in contrast to the more rapid staff turnover which is a feature of government extension services.

E. FELDA and the Kenya Tea Development Authority (KTDA)

5.22 In view of FELDA's success in the short and medium term, it is interesting to compare its performance with another state-owned enterprise which has also been successfully associated with smallholder treecrop development: the KTDA. Analysis of this institution's effectiveness was also

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16/ An interesting counterpoint is rubber: labor-saving techniques are being used throughout West Africa, but are much less evident in Malaysia where the large private estates have for some time been diversifying out of rubber. Line responsibility for this crop continues to rest with RRIM and RISDA.

17/ "The Design of Organizations for Rural Development Projects--A Progress Report" W. Smith, F. Letham, B. Thoolen, SWP# 375.

traced to internal and external factors. Key external reasons were: (a) favorable domestic and international economic conditions for the crop, in this instance tea; (b) supportive government policies which are somewhat linked to the third factor; (c) financial autonomy from Government, including operational independence. Internal factors include: (a) institutional structure; (b) control over strategic processes; and (c) incentives and accountability.

5.23 Clearly, FELDA experienced a similarly supportive external environment. Of interest is the importance to KTDA of financial autonomy, and the direct financial relationship between KTDA and its growers whereby KTDA earns revenue through the provision of services. FELDA has had much less financial autonomy in the sense that it is dependent on budgetary allocation, but it too has incorporated the principle of levying management fees for its services and ensuring that its costs are recovered.

5.24 In respect of internal factors accounting for success, KTDA also drew heavily on the experience of the commercial tea estates in Kenya. The institutional structure of KTDA was carefully designed to ensure operational control over key aspects of production, subsequently extended to field and factory operations. FELDA's degree of control and conditionality has already been noted. As a reinforcing mechanism to the operational control, KTDA's sequencing of strategic control focussed most of the management effort on the most critical activity at the particular point in time. Thus, in the early years when the quality of the planting material was crucial, emphasis was placed on this aspect, but when the important operation became the quality of the plucked leaf, management attention shifted to inspection of harvesting operations. This shift in effort was also influenced by the increasing experience of the growers and KTDA was gradually able to relax control. This clearly has not been the case in the FELDA system. Finally, KTDA perfected a system of sanctions and incentives among all parties involved in the undertaking: "there is an incipient tension betwen different stakeholders--growers, field staff, factories, senior management--in which it is within each group's interest to evoke high performance from others and in which each group has some power and sanction to do so effectively."[18/] While this is evident between FELDA and the state and federal governments, it is not the case between FELDA and the settlers. There is much more of a sense of dependency rather than a spirit of interchange with management whereby the latter's control over production is checked and balanced by grower control over the agency--in KTDA's case through the ownership of shares. Indeed the FELDA corporate style has been to regard the settlers much more as a family, i.e., as junior partners, with the result that in the problem-solving and other aspects of management, the responsibility has been seen by FELDA and settlers alike to rest with FELDA.

5.25 FELDA argues that the inherent high cost involved in land development to oil palm mitigates against any less control. The question must still

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18/ "Control, Accountability and Incentives in a Successful Development Institution, The Kenya Tea Development Authority", G. Lamb and L. Muller, SWP# 550.

be raised and has to be left open as to what extent this control is really necessary, particularly now that the oil palm settlers have demonstrated that they can be as productive as the private estates and certainly when teamed up with the efficient supporting services provided by an agency such as FELDA. The question as to whether the FELDA system can or should continue as in the past is of utmost importance. There is no example in the developed world where farmers have not wanted--and obtained--responsibility for managing their own activities. There is no doubt that if the first generation of settlers has readily accepted FELDA's management style, the second generation will likely reject this. Of more importance to Government is the fact that this continuing mobilization of the scarce government financial and human resources to sustain benefits which could be the responsibility of the beneficiaries themselves is not justified in a country where so much remains to be done for landless poor and farmers with subeconomic holdings.

F. Role of the Bank

5.26 The Bank's contribution to FELDA's institutional development over the period is difficult to assess precisely. Positive contributions from the Bank center on first, the decision to carry out the regional master plan on which the projects were based. This has proved an excellent feature and reinforces the importance of careful project preparation. Although this can be a time-consuming process, the benefits to be obtained more than outweigh the effects of the lack of such a plan as has been noted in other rural development projects. Second, the strengthening of financial monitoring and management performance has also been beneficial and is to be commended given that this is an area which is often overlooked in Bank-supported projects. And third, the technical assistance has improved the extraction rate of the mills.

5.27 The Bank has often been critical of FELDA's achievements, particularly in respect of the cost per family, plot size and income targets which have generally been considered to be above the limits normally calling for Bank assistance.[19/] This impact evaluation concludes that while there are advantages in having Bank guidelines, they should be implemented flexibly after careful analysis of local conditions which might argue against uniform application. The fact that these projects have produced important lessons of success would indicate that the Bank can also learn from its Borrowers, if only for wider application of the lessons learned to similar projects in other countries. It is one of the findings of this impact evaluation that little is known among Bank staff and other Bank Borrowers about FELDA's successes, settlement methodology and technical achievements, when many countries are trying to develop similar undertakings.

19/ The Bank's issues paper on agricultural land settlement (1978) promotes a strategy of (a) lower costs, (b) lower incomes, (c) more work for families in the initial development period, (d) less work for families in the production period and, consequently, and (e) more poor people settled.

5.28 It is generally recognized that the FELDA schemes are the most expensive rainfed settlement projects in the Bank's portfolio. FELDA does, however, include all costs of social and physical infrastructure, unlike many settlement projects where these are subsumed under government budgetary allocations or are included as part of another project. Given, however, that Malaysia has a distinct comparative advantage in producing oil palm, which requires a high investment because of the vertically integrated processing operation which this crop demands, it can certainly be argued that the incremental costs involved in assuring that production will reach targets are outweighed by the high returns obtained to all parties in the undertaking. Concern about plot size has been closely linked to the issue of high income levels. In Malaysia, with its comparatively high per capita income and correspondingly high relative poverty levels, income from these schemes needed to be attractive to get the traditionally immobile rural Malays to move. Providing a plot of sufficient size to provide an adequate income, given the declining rubber prices, enabled settlers to devote their entire effort to rubber and not to revert to subsistence rice production. This kept the earning potential high, not only for the first generation, but for future generations as government policy had intended. At the same time, concern over high income levels has increased with the benefit of hindsight, but the Bank did not forecast the extent to which oil palm prices would rise over the period. This in large part explains the currently high income levels. Furthermore, the Bank, in its suggestions to Government for a national agricultural policy[20/] over the next two decades, gives strong support to the maximization of net farm incomes to overcome the structural weaknesses which have been caused in part by the rapid rise in non-farm incomes since 1975.

5.29 In conclusion, if Government is to assist those below the poverty level in Malaysia, it is difficult to see, given the situation prevailing in Malaysia, how else this can be accomplished successfully and particularly in terms of lower cost per family, smaller plot size, lower income levels, etc., to conform to Bank guidelines. What is of concern to this impact evaluation is, given that FELDA has devised a successful formula, greater attention should be given to ensuring that FELDA does not merely consolidate its operations but continues to provide opportunities for the remaining landless poor in Malaysia, for whom few alternative opportunities exist in their traditional coconut/padi/fishing occupations.

VI. ENVIRONMENT

6.01 When the Jengka projects were prepared in 1965 the greater part of the Triangle was forested, most gazetted as a reserve. This reserve, largely undisturbed forest and swamp land, was surrounded by logged forest which had been exploited in varying degrees over many years; logging was then the principal economic activity of the triangle. Some settlement had taken place largely by smallholders on the banks of the Sungai Pahang, cultivating rice in the swamps, grazing their buffaloes and obtaining casual employment in

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20/ Consideration for a National Agricultural Policy, June 23, 1982, p.4.

nearby rubber/oil palm estates or in the towns of Temerloh, Maran and Jerantut.

6.02 With the substantial change in land use in the Triangle with land settlement and development to treecrops, this impact evaluation paid particular attention to first, the extent to which such development was carried out in accordance with prevailing Government and Bank guidelines; second, the environmental impacts of converting these forests were assessed particularly with regard to watershed protection, wildlife populations, consequences for the existing population and side effects such as pollution; and finally, the degree to which this large-scale land development has been instrumental in strengthening environmental policies in Malaysia in general and its institutional capacity in particular.

A. Projects' Design: Adherence to Government and Bank Regulations

6.03 The regional master plan specifically advised the adoption of government guidelines and it is to the credit of FELDA that these were adopted and in some cases later improved upon based on experience gained. Regulations were in existence dating back to 1922 with the Silt Control Enactment and subsequent statutes governed soil and water conservation, forests and wildlife. The Silt Control Enactment together with the 1960 Land Conservation Act provide for the prohibition of vegetation clearance on steep slopes to prevent soil erosion and siltation. Forestry enactments govern the removal of timber while the Wild Animals and Birds Protection Ordinance of 1955 gives adequate direct protection to wildlife. State water enactments regulate the abstraction of water, modification of channels and construction within certain limits of either bank. Despite the fact that enforcement of these regulations over the years has tended to be lax, in part because responsibility has traditionally been vested with state and local officials rather than those with more direct interests such as the Department of Agriculture and DID, this impact found no evidence that the Jengka projects contravened existing legislation at the time the projects were prepared and appraised.

6.04 The Bank had no enunciated environmental policy during the projects' planning and implementation although a considerable number of policies have since evolved which would govern the design of these projects.[21]/

B. Projects' Environmental Impact

Wildland Conversion

6.05 The loss of forest resources with the development of the Jengka Triangle has to be placed within the national context. The development of

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21/ These include "Tribal Peoples and Economic Development: Human Ecologic Considerations", World Bank 1982; "Environmental Policies and Procedures of the World Bank", World Bank 1984; "Wildland Management in World Bank Projects: A Policy Proposal", World Bank 1984 and "Managing Elephant Depredation in Agricultural and Forestry Projects" J. Seidensticker, 1984.

Jengka did not by itself represent a particularly serious loss of forest resources, but it was one of many projects under federal and state policies which required the clearing of extremely diverse lowland forest. In 1958, 80% of peninsular Malaysia's 13.1 million ha was forested; in 1985 less than 49% is forested and it is generally accepted that all the country's lowland forests outside of the delineated national parks and reserves will have been logged if not cleared by 1990.

6.06 About 80% of Malaysia's mammals live in lowland forest, so clearing of these forests has a considerable effect in terms of reduction of wildlife populations and represents the major threat to their continued survival. The clearing of the forested area in Jengka has resulted in almost all species of forest animals becoming rarer. Large mammals which lost their traditional habitat include about 24 elephants, 40 forest ox and 5 Sumatran rhinos, all these species being protected by law. Most of these animals have moved east, but this area is now being settled and the nearby forest reserves are likely to have their own resident animal populations. The projects, through deforestation, have also had a negative impact on freshwater fish, but since no inventory for the area was made against which present conditions can be compared, it is not possible to ascertain the effects of turbidity and increase in temperature.

6.07 Conversely, wildlife have had a significant impact on the projects' development: elephants alone have been responsible for the destruction of nearly 79,000 young oil palms, equivalent to an area of 530 ha and costing over M$300,000 to replant. The 13 elephants responsible had been pocketed in the eastern forest reserve and, faced with habitat loss, had ventured into the eminently suitable newly-planted areas of oil palm. In addition to replanting costs, the game department spent almost M$1 million capturing these elephants which were then sent to other reserves. As a result, elephants are no longer a problem in the Jengka Triangle, and the experience gained has been put to use elsewhere (para. 6.22). There is no doubt that the projects had a negative impact on wildlife, but it is worth noting that at the time of project implementation, wildlife conservation strategies were much less well developed than they are today.

6.08 The master plan made provision for land unsuitable for agriculture or settlement to be left as forest reserves. These have been included as planned, principally for watershed protection, but their role as wildlife reserves is also relevant. Logged forests not subject to continual disturbance as is the case in Jengka are able to support a considerable number of the smaller species found in undisturbed forests.

6.09 In accordance with guidelines issued by DID, areas of forests have been retained along certain river banks. It was found, however, that these areas are less well protected near the villages and the regional center of Bandar Pusat, although it should be noted that forest reserves in Jengka are not used as sources of fuelwood, because most settlers cook with gas or kerosene stoves.

2. Watershed Protection

6.10 Watershed protection has been carefully followed in Jengka. In its land classification, FELDA established a rational and reasonable division between the different potential land uses with degradation and the clearing of steep land avoided. Furthermore, small areas of low potential for agricultural use between areas of steep or otherwise unsuitable land were not developed but included in the forest reserves. The impact also found that the land clearing procedures used by FELDA with emphasis given to labor intensive manual felling have resulted in less damage to the environment than would have occurred with mechanized methods. The conversion from forest to plantation was carefully managed. It was undertaken rapidly and as far as possible took into account weather conditions, while clearing was also spread over several years, ensuring that large areas of soil were not left unprotected for long periods of time. Virtually all components were implemented with consideration given to possible soil loss and erosion, although some soil erosion is evident along roadsides requiring implementation of the protective measures developed elsewhere in Malaysia. An inevitable consequence of the change from forest to plantation has been the increase in water yields which has resulted from lower evapotranspiration rates in the plantations compared with the forested areas. However, much of this water is "lost" during (increased) peak flows, which partly explains occasional water shortages in the Jengka area during the dry months. Another explanation is the increasing water demand resulting from settlers' expanding their houses as well as poor operation and maintenance of the water distribution system. The effects of this have to some extent been overcome by building temporary sandbag dams and transportation of water by tankers.

6.11 The mission found no evidence of climatic change as a result of the development on Jengka. Rainfall data for the period 1972-79 recorded relatively low levels which could have been caused by greater reflectivity of unforested land. Since then, annual rainfall figures have fluctuated greatly and, when viewed against natural variation, very little can be concluded from the available rainfall, temperature and other weather data. Thus evidence is not available which would either support or counter the U.S. General Accounting Office (GAO) finding in 1974 that clearing of natural forest in areas such as Jengka has resulted in changing climate characteristics.

3. Human Ecology

6.12 Although the appraisal reports indicated that the Jengka Triangle contained "no permanent population", the Department of Orang Asli Affairs indicates that about 110 families of tribal peoples or a total of about 330 people were affected by these projects, with about 75 orang asli actually being displaced from an area now occupied by scheme 6. It is not clear whether the orang asli were not classified as permanent because of their practice of shifting cultivation or whether they were disregarded because of their small numbers. There are no orang asli settlers in Jengka, probably because of the large differences between their traditional way of life and the required lifestyle of settlers in a FELDA scheme. The Semoq Beri tribe, which constitute the majority of the orang asli affected by these Jengka

projects, live traditionally in individual family houses rather than the long houses like other groups, and so settlement in villages is not a considerable change for them. At the same time, however, they do not have a notion of land ownership, but rather the idea of the right to cultivate certain areas--a concept which would be hard to reconcile with FELDA's system either for rubber or oil palm cultivation. Instead, provision was made for their resettlement nearby and compensatory land has been provided.

4. Pollution

6.13 Effluent from oil palm mills when untreated and discharged directly into a river not only has a devastating effect on fish and other animals, but also on the earnings of fishermen--traditionally one of the poorest groups in Malaysia. Location of mills was not regulated at the time of project implementation and it is to FELDA's credit that the mills were sited relatively far off their water source. This was beneficial in that the raw effluent, by having to travel a similar distance and often being discharged into a swamp, then had a lower biological oxygen demand (BOD), avoiding to some extent the effect of reducing the concentration of dissolved oxygen in streams and rivers to below that required by most aquatic animals. Since the introduction of the Environmental Quality Act in 1974, FELDA has taken steps to ensure that the BOD of the effluent from its existing palm oil mills has been progressively reduced in keeping with the guidelines. Six of the palm oil treatment plants in the Jengka area became fully operational in 1982, two in 1983 and one each in 1984 and 1985.

6.14 The settler survey revealed that settlers perceive the rivers in Jengka to be polluted. This was investigated by the mission and after discussions with palm oil mill staff, settlers, and staff of the Department of Environment, it was concluded that no evidence was available to support this contention. One incident of raw effluent being discharged from a private mill occurred in 1974 and similar events have also been reported from near Sungai Pahang, but none have been reported in Jengka itself.

6.15 Nor are there indications of fertilizer being leached into the rivers: water quality measurements undertaken between 1977-79 revealed that there was little evidence of inorganic nutrients in the water, well within the guidelines for drinking water in developed countries. Pesticides have been used, but now only in very low quantities with natural control being the preferred method.

6.16 In conclusion, it is evident that FELDA adopted guidelines and closely adhered to the then existing regulations regarding the means of clearing land, of choosing the best areas for planting, determining which areas were to remain uncleared and siting of the mills. As a result, much less environmental depredation occurred than might have been expected. Environmental aspects which have suffered the most as a result of Jengka's development have been the lowland forest and its land and water fauna. These changes have not been monitored and a detailed assessment of the seriousness of this impact is not possible. Strategies have since been developed in Malaysia and in neighboring Indonesia which would today have resulted in the elephant problem in particular being resolved in a more satisfactory manner.

C. Projects' Impact on Environmental Policies and Institutions

6.17 An important impact which these projects had on government policies was the mission mounted by the Bank's Office of Environmental Affairs (OEA) in early 1975. As a result of the GAO team's findings (para. 6.11) this mission was charged with assisting in the preparation of environmental guidelines, identifying priorities to be incorporated into the Third Malaysia Plan and establishing a mechanism which would ensure a continuous Bank-Government dialogue on environmental issues. The mission itself worked closely with government officials in carrying out its terms of reference.

6.18 In other respects, these three projects have had only limited impact on government policies for two principal reasons. First, from the beginning they were not expected to be lesson learning; there was no environmental monitoring initiated in Jengka. The regional master plan considered environmental objectives only in terms of determining land capability and suitability and encouraged adherence to national guidelines for the maximum slopes to be cleared and for riverbank protection. Factors such as loss of forest resources, wildlife populations and tribal peoples were not addressed either in this plan or in the appraisal documents.[22/] An opportunity was missed by not charging the agricultural research station in the triangle with monitoring environmental changes. The results would have greatly helped the preparation of these later land use plans both within and outside of Malaysia.

6.19 A second reason was the existence of sufficient statutes on the books reflecting government policies ranging over many aspects of environmental control and protection. What had been missing from earlier government legislation was the protection of wildlife habitat deemed to be the main threat facing most species. This was addressed, to a large extent, in the 1974 Environmental Quality Act charged with enhancement of the environment, particularly the preparation and review of Environmental Impact Analyses (EIAs) of development projects. The Act was also aimed at the prevention, abatement and control of pollution, particularly palm oil effluent with criteria established to be progressively enforced and fully effective by January 1984.

6.20 Nevertheless, it is evident that the institutional capacity to translate these policy directives into action is weak. This is largely due to a diffusion of responsibility for environmental affairs between many agencies operating at both the state and federal levels. States are responsible for land, agricultural, forest and most water affairs. Public pressure and the need to have legislation enforced nationwide resulted in a Division of Environment being established within the Ministry of Science, Technology and Environment following the 1974 legislation. This division, however, is still

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22/ This is in contrast to the master plans subsequently developed for both Pahang Tenggara and Trengganu which defined environmental issues in much broader terms--most likely as a result of increasing awareness worldwide.

a long way from being able to deal with or speak effectively to environmental management problems. It has not taken the leadership in environmental issues despite the expectations of the 1974 legislation, tending to confine its scope and responsibilities to pollution prevention, undertaking spot checks and levying fines. EIAs are not yet required by law and, while several agencies have voluntarily conducted their own assessments, no formal government machinery exists to review and implement their findings.

6.21 This is in contrast to neighboring Indonesia where responsibility for environmental aspects is vested at the federal level with no provincial offices. Under a dedicated and strong leadership it has been able to achieve the cooperation and coordination of different agencies which is still missing in Malaysia. It has worked closely with a range of departmental ministries, universities and non-governmental organizations and taking as its underlying assumption that developmental and environmental management must cooperate, it has achieved remarkable success in environmental management, education and awareness. While the situation is somewhat different in Malaysia, where the power of the states over land issues is a major concern, the fact remains that even if the focus is shifted to the state level, there is still a need for the cooperation and coordination of many agencies. The state bodies continue to be organized as line agencies primarily concerned with revenue collection and thus no single entity can assume responsibility for a range of environmental concerns.

6.22 Against this background, therefore, the role of FELDA, including the guidelines which it has developed from these projects' experience, is noteworthy. FELDA secured interagency coordination with the Forestry Research Institute, Universiti Malaya, DID, and the Department of Environment to undertake a watershed study of the Sungai Tekam area just north of Jengka. At the same time, FELDA has worked closely with the Wildlife and National Parks Department in developing the "felephence", an electric fence of which about 1000 km are now in use in FELDA and other schemes in the peninsula. Finally FELDA, in conjunction with the DID, produced guidelines on the clearing of forests--again a direct result of FELDA's involvement in the development and management of schemes such as the Jengka Triangle.

VII. CONCLUSIONS

A. Sustainability

7.01 The recalculated rates of return for all three projects and the findings of the settler survey demonstrate that, seventeen years after the first investment, these projects have sustained a net flow of benefits. This section recapitulates the findings of this impact evaluation in terms of the evidence of sustainability, then analyzes the reasons behind such sustainability.

1. Sustainability of Projects' Operations

7.02 The five recalculated economic rates of return for oil palm and rubber were, in all instances, equal to or higher than projected at appraisal, although slightly lower than expected at the respective projects' completion. Of interest is the fact that this satisfactory outcome is due not to commodity prices being significantly more favorable than projected at appraisal and completion. Prices have, in four of the five instances, been lower than forecast at completion and only slightly higher than estimated at appraisal. Rather, these satisfactory results are due to high yields, particularly for oil palm, which have been significantly and constantly higher than those obtained either by smallholders outside of the FELDA schemes or in Bank-supported oil palm projects in other countries and comparable to those obtained in the private estates in Malaysia. Such returns have been strong enough to offset not only adverse price effects but also lower than expected palm oil extraction rates and lower than expected area planted to rubber. The difference between the rates of return calculated at completion and those recalculated for this impact evaluation--lower in all five instances--is explained by the lower than expected price for both commodities together with increased operating costs.

7.03 The higher than expected yields already noted explain the sustainability of agricultural benefits. Both the oil palm and rubber are well established and the excellent climatic and soil conditions undoubtedly result in high and steady FFB production in particular. Since two-thirds of the oil palm schemes are now at full production, and total production for each stage is in line with appraisal estimates, there is no reason to doubt that oil palm in immature schemes will not follow the same pattern. Yields of rubber in the first two stages were also lower than estimates in the initial years, but have gradually improved, although not to the extent illustrated in the oil palm sector. Rubber schemes now at full production, however, have exceeded yield forecasts while others have remained continuously below projections. This yield variation is unlikely to be due to climatic, soil or management conditions; one explanation is unofficial sales, which would not be reflected in FELDA's official figures. Production of rubber has tended overall to be below estimates, in part due to the apparently lower yields and in part to lower area planted, but is expected to reach projections when all schemes attain maturity.

7.04 Sustainability of the social benefits has been achieved; it is, however, open to question for the longer-term developmental impact of these projects (chapter 5). On the one hand, the settlement schemes are permanent establishments with low settler turnover, which is of considerable credit to FELDA given the diverse backgrounds of settlers and their traditional immobility. Social infrastructure, particularly education, has been an important factor in both attracting and retaining settlers. Settlers report a satisfactory quality of life; the schemes were intentionally sized to take advantage of government-sponsored facilities. The financial benefits have reinforced the schemes' attractiveness. On the other hand, the dangers of such a dependence (95% of settler incomes are derived from either oil palm or rubber) on international price movements are evident in the steady fall in

rubber prices over the period. Such a high percentage of incomes from one source is an unusual precedent in rural Malaysia where diversity of income sources among on- and off-farm activities is the norm.[23]/ Despite high levels of consumption over the period, however, there has been little development of secondary economic activities within the Triangle, a feature which was also noted in the settlement projects in Papua New Guinea. Settlers continue to see FELDA as a father figure and have little interest in scheme management, which raises questions regarding the settlers' future.

7.05 The sustainability of the institutional benefits, in terms of FELDA, is not in doubt. Despite rapid growth, FELDA has constantly used its experience to accelerate its development program. Loan recovery from settlers is good, while FELDA in turn has funds available either to repay its loans to Government or to invest in downstream activities. These projects illustrate that a parastatal organization can indeed combine both commercial and social objectives successfully on a continuing basis. The potential problem is FELDA's management style which has precluded spirit of enterprise and initiative among its settlers who must, in the future, manage the schemes themselves.

7.06 Most of the indirect benefits are clearly sustainable. There are considerable economic and social linkages between Jengka and the surrounding economy. The importance of oil palm and rubber production to the economy overall highlights the backward and forward linkages, the former in respect of fertilizer use, most of which is manufactured in Malaysia, and the latter in terms of transportation and bulk handling facilities required as well as development of refining capacity. These are likely to continue, given historical production trends. Multiplier effects are noticeable in respect of the non-settler commercial development on the fringe of the Triangle, a development which will continue, given the settlers' high propensity to consume. Moreover, studies have shown that 70% of settlers' consumption is satisfied by local production. The fact, however, that job opportunities have not developed within the schemes for settler children will result in problems in the future. At present, the second generation are leaving the schemes and agricultural activities may be less attractive after some years spent in other applications.

7.07 FELDA has generally shown itself sensitive to environmental aspects: satisfactory standards in respect of land clearing resulted in minimal soil erosion, the original land use plan was flexibly implemented when it was found that slopes were too steep to be planted to oil palm and the mills were sited far enough from water sources to prevent pollution. The adverse effect of the projects on human ecology was partly offset by the resettlement and provision of compensatory land to displaced tribal peoples. Wildlife was definitely harmed by the projects, particularly elephants, which used to inhabit the project area. As with all agricultural development of this nature, the clearing of forest has resulted in almost all species of forest animals becoming rarer.

23/ The initial FELDA farm model combining tree crops and other crops was never developed due to potential problems of marketing and technology.

2. Factors Accounting for Projects' Sustainability

7.08 Reflecting the findings on sustainability in OED's Tenth Annual Review of Project Performance Audit Results, the most important factor accounting for project sustainability in these Jengka Triangle projects is institutional effectiveness. A striking finding of this impact evaluation, however, is that the remarkable growth and success of FELDA has been accomplished largely through its own efforts.

7.09 FELDA's approach can be summarized as, first, strategic planning to combine the best of the smallholder agriculture sector with that of the estates sector. The value of this approach has been confirmed in the findings of a recent review of experience with 34 Bank-supported land settlement projects which highlighted that greater attention should be given both to the settlers themselves and to production priorities. Second, it has perfected a system in which risks are minimized. Problems which have been encountered in some other countries (Ivory Coast, and neighboring Indonesia for example) have been avoided. In Ivory Coast, the basic errors were to (a) overestimate growers' ability to adapt to modern treecrops and (b) grant agricultural credit to farmers unfamiliar with the constraints credit entails and who tend to evade repayment without compunction. In Indonesia, delays occurred prior to first harvest because the crop was poorly planted by settlers inexperienced in oil palm. Settlers are also reluctant to move to the new schemes until harvest begins because of the lack of employment/income earning opportunities, which in turn has adversely affected yields. The cost implications of FELDA's risk minimization strategy have attracted considerable criticism. FELDA argues, and this impact evaluation agrees, that in view of the high initial investment costs for oil palm, the high benefits obtained from the successful development of new land to oil palm and rubber more than outweigh the incremental costs attached to providing social infrastructure and ensuring the productive aspects are correctly in place.

7.10 A second important institutional factor explaining project sustainability is the adequacy of management provided by FELDA. FELDA's management style exhibits certain characteristics which have been noted in respect of successful institutional performance of another parastatal organization dealing with tree crops: Kenya Tea Development Authority. Unlike this institution, however, which has phased out its control, FELDA's control of both on- and off-farm activities continues. This may be viewed as an integral part of FELDA's success, but is also a matter of concern for the future (see below on future prospects).

7.11 FELDA has also provided the mechanism for the effective transfer of another factor which has provided a key role in sustainability: technological adoption. The technological success of these projects, particularly for oil palm, whereby smallholders are producing yields comparable to those reached in the private sector, is in part due to FELDA providing the necessary institutional framework to assure both timely and reliable delivery of elements of the technical package as well as the necessary processing and marketing capability. The importance of FELDA's role in this regard is highlighted when it is recalled that no other institutional mechanism exists at

present in Malaysia to assist smallholder oil palm production. This finding of the impact evaluation is contrary to that reported in the OED review of sustainability which concluded on the basis of experience analysed from 25 impact evaluation reports that there is "an enhanced probability of failure inherent in the wholesale introduction of a technology with which there has been no prior experience within the region or the country. The complex behavioural changes required and the results produced through interactions with existing cultural practices are inevitably extremely difficult to predict with an entirely new technical package." This highlights the projects' technological success given that only 6% of settlers had any prior experience in oil palm.

7.12 Project sustainability can also be explained in terms of supportive government policies (para. 5.17) and changes in the economy during the time these projects were being implemented, particularly the commodity boom which led to overheating of the economy (para. 1.08). FELDA schemes, therefore, are in the enviable position of producing oil palm and rubber without facing either shortages or increased costs of labor, a situation encountered increasingly in the estates sector.

B. Future Prospects

7.13 While sustainability of these three projects is not in doubt, questions remain as to the future prospects for both the existing settlers after loan repayment and the second generation of settler children. This particular timeframe is beyond that normally analyzed for an impact evaluation. In view, however, of the importance of both the oil palm/rubber sectors to the economy in general and FELDA's production of each commodity in particular, combined with the important poverty alleviation objectives achieved, this aspect requires analysis.

7.14 Questions regarding the future prospects for existing settlers essentially concern what will happen once loans have been repaid and titles pass to settlers. This is likely to happen within the next three years in the case of the existing oil palm settlers, most of whom have no arrears on their loan accounts.

7.15 In the short run after title has been ceded to settlers and before the oil palm needs to be replanted, settlers could probably continue with light FELDA management and with the block system continuing to coordinate agricultural activities. A few years after, however, there will be a need for replanting. This assumes that 45 to 50 year-old settlers (according to the survey, only 25% are willing to retire at that time) will want to take out another long-term loan. As the replanting cess for oil palms has only been in existence for a few years, a substantial part of the replanting cost will have to be covered through new loans to settlers. The loan principal is likely to be smaller than that granted under the three projects under review as the development costs would essentially consist of replanting, and not housing, garden plots, etc. The settlers, however, will need new subsistence loans as they will be deprived from the revenues for some years before the oil palm bear fruits. The survey showed that the majority of settlers want

FELDA to continue managing the schemes when replanting time arrives, which raises the question as to whether and how FELDA is going to be bound to Jengka oil palm settlers for a new cycle of 25 years.

7.16 The future prospects for existing rubber settlers are somewhat different. These settlers appear less dependent on FELDA. This may be due to the individual nature of their agricultural operations. In the short run, the future prospects of rubber settlers are less of an issue because the greater incidence of loan arrears means that FELDA management will continue for a number of years until outstanding payments are fully recovered. Moreover, the time until replanting is considerably longer for rubber than for oil palm, unless there are further breakthroughs in technology which would justify earlier replanting. In the longer run, if FELDA management continues, the questions will revolve around which crop should be planted.

7.17 Consideration of the second generation essentially covers two aspects. First, whether there will be sufficient interest among settler children to take over title to the plot and second, if there are, whether they will accept the FELDA hierarchical management style. Doubts have been raised as to whether children will wish to return to Jengka to inherit title from their settler parents. The survey clearly showed that only a few settlers wished their children to continue in farming. Consequently, children have been conditioned from a young age not to look to Jengka for their livelihood. In view of the lack of job opportunities available in the Triangle for settler children, the majority will have left the schemes for about 5-10 years to live in cities between the time of completing their education and the time of their parents' retiring. For children who would return to Jengka, this may also lead to problems in readjusting first to living in the country and second to agricultural activities. Given the fact that family size in Jengka is above the national average, however, it seems likely that there will be one child interested in inheriting title. Potentially more significant is the fact that it is unlikely the tight system of management control currently exerted by FELDA over settlers will be readily accepted by settler children; all have had more education and have access to greater opportunities than their parents.

7.18 The extent of control exerted by FELDA over every aspect of settlers' lives has stifled the sense of initiative and self management which prompted the settlers to move in the first instance. This type of management style has been one of the reasons for project success, but self management of the scheme will be essential as it is part of the development process and because the strict FELDA control system just cannot last forever. Although the settlement study concluded that the type of management in any settlement scheme is much less important than the fact of adequate management, equity considerations in Malaysia mitigate against the continuation of the existing management style. There are still large numbers of landless poor or farmers with subeconomic holdings for whom few alternative opportunities exist. It is untenable that settlers who have been assisted by FELDA for twenty years, and who will shortly have title to both a 4-ha plot of land, which yields an income considerably above the poverty level, and a house with access to a range of social amenities, should continue to absorb scarce resources which could be better deployed in reaching the remaining poor.

7.19 The involvement of the second generation in the schemes would present an excellent opportunity for settler self management. At the same time, however, the question has to be further explored as to whether FELDA regards its management style as a precondition to achieving economic success or as necessary because the settlers are viewed as having only limited capacity for self management.

7.20 It seems unlikely that FELDA would have taken the latter view as project experience reinforces earlier evidence available, that smallholders can be efficient low-cost producers of treecrops with adequate training. A comprehensive study of the rubber industry[24/] highlighted this and concluded that there are considerable advantages to smallholders growing rubber: the technique of production is simple, there are no economies of scale to be obtained, the product is highly standardized, easily marketable and the buying competition is usually keen. The project experience has also shown that oil palm smallholders have been able to organize themselves and to become progressive farmers, the major drawback being the difficulties in replanting. This, however, would not have been an issue in Jengka with the schemes comprising only the development of new lands to rubber and oil palm. Clearly, therefore, since smallholders are known to be efficient producers, the FELDA management style will have to change unless it is a reflection of a corporate culture which takes as its basic assumption that to achieve the production objective successfully, a regimented and tightly controlled system is necessary. If there is indeed a tradeoff between economic/agricultural success and longer term project sustainability, then it is evident that for FELDA to continue to provide opportunities for the rural poor and also to accommodate the second generation will require a more fundamental and deep-rooted change than if it had merely been a style of management which had reflected the needs of the time--and which could be changed again once the existing settlers with their apparent inherent limitations had given way to the second generation.

C. Replicability

7.21 In view of the success of these three projects the question has to be asked what lessons can be distilled from project experience which can be applied to other Bank-supported projects of a similar nature. In other words, what factors of success rely on Malaysian conditions and thus would be difficult to transplant elsewhere and what factors are of a more general nature which could have wider applications.

7.22 The first lesson that can be drawn from project experience is that the presence of a high-value crop has been a strong factor in (a) attracting and retaining government support at both the federal and state levels where revenues generated from the Jengka Triangle have been considerable; and (b) providing sufficient financial returns to settlers which has helped retain settlers in the schemes and has assured a cost recovery record of 98% for oil palm settlers and 65% for rubber settlers.

24/ Bauer, P. The Rubber Industry: A study in Competition and Monopoly, 1948.

7.23 The factors of success behind this high-value crop are first and foremost high yields, which have offset price variations. The high yields are due to conditions particular to Malaysia (the climate, soils and pest-free environment), and to technological developments, in terms of disseminating basic research and an effective institutional framework for adaptive research and extension. The lesson for replicability of settlement projects of this nature is the importance of a high-value crop which derives its return not from high prices but from high yields, based upon a sound technical package well adapted to local conditions and taking labor requirements at the farm level. The projects also showed the danger of minimizing or not fully understanding the positive role of women at the farm level.

7.24 The second lesson to be drawn from project experience is the importance of land ownership. This has been a major factor in the success of land settlement both in attracting and retaining settlers. Project experience demonstrates the powerful incentive that potential ownership of a 4-ha plot of land conveys to landless and traditionally immobile rural poor, particularly when this is backed up by social infrastructure. When settlers first took the decision to move to Jengka, neither they, nor FELDA for that matter, realized the financial returns that would be gained from the increased yields and prices of oil palm, which was then an essentially untried crop in Malaysia with low price forecasts.[25/] Three lessons for replicability can be drawn. First, the availability of distributable lands (uncleared jungles or state-owned land are still available in many countries); second, where ownership of land is a key incentive to potential settlers, an important prerequisite is to have a settler selection system which ensures that the landless benefit. In many countries, new settlement schemes are taken up by those who already have landholdings or occupation elsewhere and thus become absentee landlords with little incentive to develop the schemes with their own productive resources. Third, potential ownership of land induces settlers to accept discipline, which is essential in the early settlement period for eventual project success. Conversely, the conditionality attached to land ownership, uncommon in settlement projects, can give Government good leverage to develop an orderly and satisfactory settlement system.

7.25 A third lesson from project experience is the importance of a settlement system which combines improved social infrastructure with some aspects of the traditional village system. This has also been an important feature in both attracting and retaining settlers. Settlers described education for their children as the single most important benefit, above increased incomes, land ownership or improved housing. Despite settler complaints of inadequate water supply, no electricity, and sub-standard roads, settler turnover is low.

7.26 At the same time, FELDA has designed the settlement schemes very much in the tradition of the kampungs. An important cohesive force has been FELDA's support for the settlers' religious beliefs. Most Malays are

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25/ As late as 1970, the Government was being advised by FAO not to continue with oil palm because of weak profitability.

adherents to Islam; FELDA has provided a mosque in every scheme and the organization of the social associations is in keeping with the muslim religion. In this respect, FELDA has mirrored the pattern of life which is followed in the traditional villages. The lesson of replicability is first the importance of identifying the principal constraints prevailing in the rural areas, so that the provision of such benefits--in this case children's education--offers the necessary incentive to attract potential settlers and second, that cultural/religious support provides a cohesiveness to the community which helps to establish and reinforce its sense of permanence. The danger in respect of the latter is that it can be difficult to adopt some elements of religious beliefs and not others; for example, women's rights have been to some extent eroded under the FELDA system, particularly in respect of succession.

7.27 A fourth lesson, and one which is contrary to the findings of OED's review of Bank experience with land settlement, is that there have been considerably fewer multiplier effects than might have been expected in terms of either the emergence of secondary economic activities or urban development. Both had been expected.

7.28 The failure of multiplier effects to develop cannot be attributed to lack of demand. The schemes have experienced high income levels over a sustained period of time, much of which has been spent on consumption goods or has resulted in an increased demand for services. And, studies have shown that most consumption goods purchased by settlers in the rural areas have not been imported goods; 70% of goods purchased are of Malaysian manufacture. Furthermore, many settlers would like their children to remain close to Jengka--children who, with the benefit of education, are surely in a position to see and exploit the opportunities for providing such goods and services. The Government is strongly committed to stemming rural outmigration and thus to the idea of integrated rural-urban development. The lesson for replicability is that, in cases where so much importance is attached by settlers to education of their children, where parents' aspirations for their children tend towards off-farm employment, and when there are other sectors of the economy which are growing rapidly, it seems almost impossible for job opportunities to develop within a rural environment for settler children, as was tried in Jengka.

7.29 In conclusion, to the five successful lessons of replicability outlined above, namely,

- availability of crops allowing for relatively high returns to investment;
- availability of distributable land;
- a selection system ensuring that the landless benefit;
- conditionality of potential land ownership; and
- settlement methods modelled after FELDA's but adapted to the socio-cultural context of the country;

a sixth must be added, replicability: the need for strong government support and for an autonomous settlement agency with clearly identified, long-term strategic plans. It is a striking feature of these projects that FELDA has benefited for fifteen years from strong political support at both the federal and state level. FELDA has maintained a good coordination with several other ministries and departments. Compared with many public agencies, FELDA benefited from the continuity of its senior management and its staff are motivated and energetic. The most striking aspect of FELDA is that it is and has always been a Malaysian-run organization. The identifiable drawback about such an agency is the fact that it is precisely this sense of pride and corporate loyalty demanded of FELDA staff and settlers alike which is creating problems for self management of the settlement schemes; there is little room in the FELDA philosophy for individualism.

SOCIO ECONOMIC SURVEY OF FELDA SETTLERS IN JENGKA TRIANGLE, PAHANG
METHODOLOGY

Objectives

At completion of the second Stage of these Jengka triangle projects, it was expected that a comprehensive review of settler's incomes would be undertaken. It was considered that whilst the projects had been efficiently implemented from an economic point of view, only fragmentary information was available on the impact of these projects on the settlers themselves. Despite this, however, no studies were undertaken during the third Stage to evaluate the socio-economic benefits to settlers.

As part of the impact evaluation of these three projects, undertaken when most of the oil palm and rubber schemes are at full production, a socio-economic survey was commissioned with the following objectives:

(i) determining the economic and social impact of the project on a sample of about 200 settlers in the Jengka area;

(ii) analyzing the perception of settlers on their current and future welfare and quality of life;

(iii) a detailed analysis of some subsidiary activities developed by settlers in the project area.

Sample Design

A sample survey of 229 settlers was carried out in January-February 1985 by a local consultant, assisted by two lecturers and 23 students from the Universiti Pertanian Malaysia. The sample size covered about 2.5% of the population of settlers in the Jengka, selected at random in proportion to the actual settlement of the three stages as follows:

No. of settlers interviewed	Total	Jengka Stage I	Jengka Stage II	Jengka Stage III
Oil palm settlers	146	57	45	44
Rubber settlers	83	12	31	40
Total settlers	229	69	76	84

Questionnaire

The survey was based on a questionnaire with the following seven subject headings:

- settler identity;
- settler's and settler family's activities and incomes;
- participation in settler organizations/associations;
- settler family progress indicators;
- settler perception of social infrastructure and quality of life;
- settler perception of, and attitude towards, current status and management in the schemes;
- future of settler and settler family.

The sample survey was based on interviews with heads of household only, no family members were present. Since all heads of household were men, follow up interviews with twenty women settlers were conducted in four schemes: two old and two new rubber and oil palm schemes respectively. The findings on the role of women in the settlement schemes are also based upon observations made at the quarterly meeting of social development officers of the twenty-three Jengka schemes, a monthly meeting of the GPW (Women's Institute) of one scheme and discussions with FELDA staff.

Other sources of data

In addition to this socio-economic survey, an analysis was made of 3 or 4 of the most important subsidiary activities (shops, workshops, and other business enterprises) developed by the Jengka settlers.

Information on the settlers' gross and net incomes for the year 1984 from both oil palm and rubber was obtained from FELDA where income records of individual settlers are computerized. Production and yield data for rubber and oil palm was also collected from FELDA together with ancillary background information on settlers' and FELDA's development program.

ANNEX 1: BACKGROUND

Bank Contribution Overall to the Oil Palm/Rubber Sector

The World Bank Group has helped finance 62 oil palm and rubber development projects in 14 countries (see list below). Twenty-five projects consist of oil palm, 22 projects of rubber, and 15 projects include both. Some of these projects also include a coconut or other treecrop component. By April 1985, the Bank had lent more than US$2 billion to the oil palm/rubber sector.

Twenty-six projects (42% of the total number of loans), representing US$440 million (21% of total lending to the sector), were carried out in Africa. Thirty-four projects (55%), representing US$1.59 billion (71%), were in Asia and two projects (3%), representing US$45 million (2%), in Latin America. The largest borrowers in the sector were, in order: Indonesia (15 projects), Malaysia (10 projects), Ivory Coast (8 projects), Cameroon (7 projects) and Nigeria (4 projects).

The development strategy based on estate plantations surrounded by outgrower plantings was adopted in Ivory Coast, Ghana, Liberia, Nigeria and partially in Indonesia. Estate plantations predominated in Cameroon, Zaire, Burma, Panama and some regions of Indonesia. A strategy focusing on smallholders was implemented in Benin, Sri Lanka, Thailand, Brazil, Malaysia and Papua New Guinea, project strategy in the last two countries, as well as the transmigration projects in Indonesia, being to clear virgin forest and settle farm families.

OED issued performance audit reports on 25 of the 62 projects (1 in Benin, 1 in Papua New Guinea, 3 in Cameroon, 5 in Indonesia, 6 in Ivory Coast, 5 in Malaysia, 1 in Ghana, 2 in Nigeria and 1 in Thailand). On completion, all except those in Benin and Nigeria were considered reasonably successful, with economic rates of return above 10%. Since oil palm prices were higher than projected, they generally offset cost overruns. The Benin project, with an ERR of 5%, was an exception, but on completion its social impact was considered enough to have made it worthwhile. The two projects in Nigeria had negative ERRs and failed, partly because of certain of the country's internal problems and partly because organization in the oil palm sector was not integrated.

An impact evaluation of the Papua New Guinea New Britain Smallholder Development project was issued in 1980 and largely confirmed the project's success. In 1984, four oil palm/coconut projects in Ivory Coast were the subject of an impact evaluation, the findings of which are that the

oil palm components remained relatively successful while the coconut components failed to sustain their benefits. In addition, estates proved to be more successful than smallholders. An impact evaluation was also carried out for the Benin Hinvi project, which proved to be an economic and social failure.

For the majority of projects, including smallholders, beneficiaries were granted loans for oil palm and rubber plantings. The problem of credit recovery was universal, though varying in degree, except in Papua New Guinea, where early, high yields made advance repayment possible, and in Malaysia and Thailand, where growers pay a replanting cess during the production period of the trees and receive a government grant for replanting.

The 37 projects still being implemented are affected by political and economic difficulties in some countries (Nigeria and Zaire), lower oil palm yields than anticipated (Cameroon), and depressed world rubber prices.

BANK SUPPORTED OIL PALM AND RUBBER PROJECTS

Region	Number of projects	%	Loans/credits (US$ millions)	%	Approx. Area planted/replanted (ha) Estate	Smallholder
Africa	26	42	440	21		
Asia	34	55	1,590	77	Oil Palm 158,000	236,000
Latin America	2	3	45	2	Rubber 112,000	628,000
Total	62	100	2,075	100		

Project	Amount of loan/credit	Effective date/ closing date	Project Description
		AFRICA	
Benin			
Hinvi (Cr. 144)	5.2	1969-76	Smallholder cooperative oil palm planting (16,000 ha); Construction of oil mill.
Cameroon			
1st CAMDEV (Ln. 490 and Cr. 100)	18.0	1967-73	Estate oil palm planting (6,350 ha).
1st SOCAPALM (Ln. 593 and Cr. 886)	9.6	1969-74	Estate oil palm planting (8,660 ha).
2nd CAMDEV (Ln. 1508)	15.0	1978-82	Estate oil palm (6,000 ha) and rubber planting.
2nd SOCAPALM (Ln. 1392)	18.0	1977-82	Estate and outgrower oil palm planting (7,000 ha).
Niete Rubber Estate (Cr. 514)	16.0	1975-81	Rubber estate (5,800 ha).
2nd Hevecam Rubber (Cr. 975 and Ln. 1791)	31.5	1980-85	Rubber estate (9,300 ha) rubber processing factory.
Oil Palm and Rubber Consolidation (Cr. 2180)	20.0	1982-87	Maintenance of plantations; expansion of processing facilities.
3rd Hevecam Rubber (Cr. 2485)	8.3	1985-90	Rubber estate planting (1,600 ha) and maintenance (9,430 ha) and processing facilities.
Ivory Coast			
1st Oil Palm and Coconut (Lns. 611, 612 and 613)	17.1	1969-75	Estate (4,000 ha) and outgrower (12,000 ha) oil palm planting; estate (3,500 ha) and outgrower (3,000 ha) coconut planting; construction of oil mill.
2nd Oil Palm and Coconut (Lns. 759, 760)	7.0	1972-79	Outgrower oil palm (4,500 ha) and coconut (4,500 ha) planting and estate coconut (8,000 ha) planting; construction of oil mill.
3rd Oil Palm (Ln. 1036)	2.6	1974-77	Outgrower (5,000 ha) and estate (5,250 ha) oil palm planting.

4th Oil Palm and Coconut (Ln. 1382)	35.8	1980-86	Estate oil palm (6,258 ha) and coconut (6,724 ha) planting.
Grand Bereby Rubber (Ln. 938)	8.4	1973-79	Rubber estate (7,000 ha).
2nd Grand Bereby Rubber (Ln. 1575)	20.0	1978-85	Rubber estate planting (6,500 ha); maintenance of the first project planting (7,000 ha); processing facilities.
SAPH Rubber (Ln. 1633)	7.6	1978-84	Rubber outgrower planting (3,500 ha); maintenance of estate (7,000 ha).
4th Rubber (Ln. 2323)	32.2	1983-89	Rubber estate (3,500 ha); credit to outgrowers (7,000 ha); factory.
Ghana			
Oil Palm (Cr. 531)	13.6	1976-83	Estate (4,000 ha) and outgrower (1,200 ha) oil palm planting; construction of oil mill.
2nd Oil Palm (Cr. 1498)	25.0	1984-90	Outgrower oil palm (3,500 ha); expansion of oil mill.
Liberia			
Decoris Oil Palm (Ln. 1765)	12.0	1981-87	Estate (5,000 ha) and outgrower (2,500 ha) oil palm planting; construction of oil mill.
Rubber Development (Cr. 786)	13.0	1978-85	Rubber smallholders planting (8,000 ha); and replanting (5,700 ha).
Nigeria			
1st Oil Palm (Ln. 1183)	29.5	1975-84	Estate (8,000 ha) and outgrower (8,000 ha) oil palm planting; construction of oil mill.
2nd Oil Palm (Ln. 1191)	19.0	1977-84	Outgrower oil palm planting (16,000 ha); construction of 2 oil mills.
3rd Oil Palm (Ln. 1192)	17.0	1978-84	Estate (6,000 ha) and outgrower (6,000 ha) oil palm planting; construction of 2 oil mills.
4th Oil Palm (Ln. 1591)	30.0	1979-84	Estate (10,000 ha) and outgrower (10,000 ha) oil palm planting.
Zaire			
Oil Palm (Cr. 796)	9.0	1978-85	Estate (11,000 ha) oil palm planting/replanting; Rehabilitation of oil mill.
		ASIA	
Burma			
Rubber Rehabilitation (Cr. 879)	4.5	1979-85	Rubber estate planting (1,370 ha), replanting (455 ha) and processing facilities.
2nd Rubber Rehabilitation (Cr. 1385)	9.0	1983-90	Rubber estate planting (1,200 ha), replanting (4,430 ha), and processing facilities.

BANK SUPPORTED OIL PALM AND RUBBER PROJECTS

Project	Amount of loan/credit	Effective date/ closing date	Project Description
Indonesia			
1st North Sumatra Estates (Cr. 155)	16.0	1969-76	Estate oil palm plantings/replanting (36,300 ha).
2nd North Sumatra Estates (Cr. 194)	17.0	1970-77	Outgrower oil palm planting (3,300 ha).
North Sumatra Smallholders (Cr. 358)	5.0	1972-81	Estate and smallholder plantings/replanting (23,000 ha) oil palms and rubber.
4th Nucleus Estates (Ln. 319)	11.0	1973-81	Estate plantings/replanting (23,000 ha) oil palms and rubber; processing facilities.
Transmigration I (Ln. 1318)	30.0	1977-83	Rubber smallholder planting (7,100 ha) and land settlement.
Nucleus Estates and Smallholders (Ln. 1499)	65.0	1978-82	Estate and outgrower oil palm (5,000 ha) and rubber (3,700 ha) planting; conversion from rubber to oil palms.
Nucleus Estate and Smallholders (Ln. 1604)	62.5	1978-85	Rubber estates (3,500 ha) and smallholders (15,200 ha).
Transmigration II (Ln. 1705)	90.0	1979-85	Small farms partly planted to rubber.
3rd Nucleus Estates and Smallholders (Ln. 1751)	99.0	1979-86	Rubber estates and smallholder planting (16,000 ha) with small oil palm estate component (2,135 ha).
4th Nucleus Estates and Smallholders (Ln. 1835)	42.0	1980-86	Outgrower oil palm planting (8,000 ha); construction of oil mill and rubber factory.
Smallholder Rubber Development (Cr. 984)	45.0	1980-86	Rubber smallholder planting (38,500 ha).
Nucleus Estate and Smallholders V (Ln. 2007)	161.0	1981-88	Smallholder planting: 8,000 ha oil palm; 6,700 ha coconut; 3,700 ha rubber; and processing facilities.
Nucleus Estate and Smallholders (Ln. 2126)	68.1	1982-88	Rubber estate (3,500 ha) and smallholder coconut (6,000 ha).
Nucleus Estate and Smallholders (Ln. 2232)	154.6	1982-88	Estates and smallholder planting of 29,200 ha rubber and 21,000 ha oil palm.
Smallholder Rubber Development II (Ln. 2494)	131.0	1985-91	Smallholder rubber planting (19,500 ha) and maintenance (133,000 ha).
Malaysia			
1st Jengka Triangle Land Settlement (Ln. 533)	14.0	1968-75	Smallholder oil palm (10,450 ha); and rubber planting (1,600 ha); construction of oil mill.
2nd Jengka Triangle Land Settlement (Ln. 672)	13.0	1970-78	Smallholder oil palm (6,800 ha); and rubber planting (5,200 ha); construction of oil mill.

3rd Jengka Triangle Land Settlement (Ln. 885)	25.0	1973-81	Smallholder oil palm (8,900 ha); and rubber planting (6,800 ha); construction of oil mill.
Johore Land Settlement (Ln. 967)	40.0	1974-81	Smallholder oil palm (26,200 ha) planting; construction of 3 oil mills.
West Johore (Ln. 973)	45.0	1974-83	Conversion of outgrower rubber planting (10,000 ha) to oil palm and coconut.
Keratong Land Settlement (Ln. 1044)	36.0	1975-83	Smallholder oil palm (22,000 ha) planting; construction of 3 oil mills.
FELDA VI Land Settlement (Ln. 1590)	28.0	1979-85	Smallholder oil palm (8,100 ha) and rubber planting.
Trans-Perak (Ln. 1960)	50.0	1981-89	Smallholder planting (8,400 ha) of oil palm.
FELCRA I (Ln. 2013)	37.0	1981-86	Smallholder planting/replanting of rubber (26,000 ha) and oil palm (8,100 ha), construction of 2 oil mills.
Kedah Valley Agricultural Development (Ln. 2220)	56.9	1983-88	Smallholder rubber replanting (15,100 ha).
Malacca Agricultural Development (Ln. 2147)	25.4	1983-88	Smallholder rubber replanting (9,000 ha).
Papua-New Guinea			
New Britain Land Settlement and Development (Cr. 137/175)	4.9	1969-73	Smallholder oil palm planting (3,850 ha).
Sopondetta Land Settlement (Ln. 1333)	12.0	1977-84	Smallholder (5,400 ha) and estate (4,000 ha) planting of oil palm; construction of an oil mill.
2nd Credit (Ln. 1149)	15.0	1982-84	Agricultural credit for planting of oil palm, rubber and other tropical treecrops.
Sri Lanka			
Smallholder Rubber Rehabilitation (Cr. 1017)	16.0	1980-86	Smallholder rubber replanting (18,000 ha).
Thailand			
Rubber Replanting (Ln. 1243)	50.0	1976-82	Rubber smallholder replanting (150,000 ha).
Second Treecrops (Ln. 2078)	142.0	1982-87	Rubber smallholder replanting (262,000 ha).
		LATIN AMERICA	
Brazil			
Amazones Agricultural Development (Cr. 2163)	26.4	1982-87	Smallholder oil palm planting (1,800 ha).
Panama			
Tropical Treecrop/Development (Ln. 1672)	19.0	1979-85	Planting of oil palm (3,000 ha), coffee and cocoa; construction of an oil mill.

ANNEX 1.2

Stage	Scheme	Crop	AGRICULTURAL DEVELOPMENT				MAIN SOCIAL INFRASTRUCTURE							
			Area under harvest (ha)	Year of development	Start of harvest	Settler families	Primary school	Secondary school	Health center/clinic	Community Center	Access Road (km)	Village Road (km)	Water Supply System	Mosque and Temple
Stage I														
	Jengka 1	oil palm	2,234	1967	1971	543	1		1	1	4.0	11.6	1	1
	Jengka 2	oil palm	1,877	1967-68	1971	436	1	1	2	1	1.6	7.3	1	1
	Jengka 3	oil palm	1,817	1968	1972-73	409	1		1	1	1.6	11.6	1	1
	Jengka 4	oil palm	1,453	1967-68	1972	340	1		1	1	1.6	10.9	1	1
	Jengka 5	oil palm	1,328	1969	1973	324	1		1	1	1.4	8.7	1	1
	Jengka 6	oil palm	1,712	1968-69	1973	367	1	1	1	1	4.8	10.5	1	1
	Jengka 7	rubber	1,410	1967	1975	332	1		1	1	4.8	9.8	1	1
Stage II														
	Jengka 8	rubber	1,472	1968	1977	350	1		1	1	15.0	9.4	1	1
	Jengka 9	oil palm	1,396	1970	1974	335	1		1	1	4.0	11.0	1	1
	Jengka 10	oil palm	1,702	1970	1974	415	1	1	1	1	0.1	11.5	1	1
	Jengka 11	oil palm	2,187	1970	1975	501	1		1	1	1.1	11.2	1	1
	Jengka 12	rubber	1,717	1971	1974	404	1		1	1	15.2	8.6	1	1
	Jengka 13	oil palm	1,638	1972	1975	370	1		1	1	15.2	10.4	1	3
	Jengka 14	rubber	2,022	1971	1980	465	1		1	1	1.6	11.9	1	1
Stage III														
	Jengka 15	oil palm	1,470	1972	1976	385	1		1	1	5.9	9.5	1	1
	Jengka 16	rubber	1,574	1972	1980	422	1		1	1	4.9	5.9	1	1
	Jengka 17	oil palm	1,748	1973	1977	404	1		1	1	4.9	4.9	1	1
	Jengka 18	oil palm	1,976	1973	1977	456	1	1	1	1	4.9	9.8	1	1
	Jengka 19	oil palm	2,657	1974	1977	583	1		1	1	10.6	9.8	1	1
	Jengka 20	rubber	1,193	1974	1982	482			1	1	5.6	10.6	1	1
	Jengka 21	rubber	1,457	1974-75	1982	413	1	1	1	1	4.8	5.6	1	2
	Jengka 22	rubber	1,218	1975	1982	301	1		1	1	15.5	4.7	1	
	Jengka 23	oil palm	1,888	1974	1978	434	1		1	1		15.5	1	1
Total			39,146			9,471	22	5	24	23	129.1	220.7	23	25

ANNEX 2: AGRICULTURAL AND ECONOMIC IMPACT

IMPACT EVALUATION REPORT

MALAYSIA

JENGKA TRIANGLE PROJECTS

Oil Extraction Rate
(% of ffb)

	MILLS				
	Ulu Jempul	Jengka 4	Jengka 9	Jengka 18	Average
1974	18.77	17.54	-	-	18.15
1975	17.22	17.28	-	-	17.25
1976	18.23	18.57	17.84	-	18.21
1977	18.28	18.72	17.64	-	18.21
1978	18.21	18.46	18.76	-	18.48
1979	17.59	17.44	18.23	17.53	17.70
1980	16.92	17.59	17.70	18.44	17.66
1981	17.14	17.76	17.68	18.61	17.80
1982	17.08	18.16	18.65	18.43	18.08
1983	16.98	18.26	18.62	18.70	18.14
1984	16.30	18.03	18.49	18.93	17.94

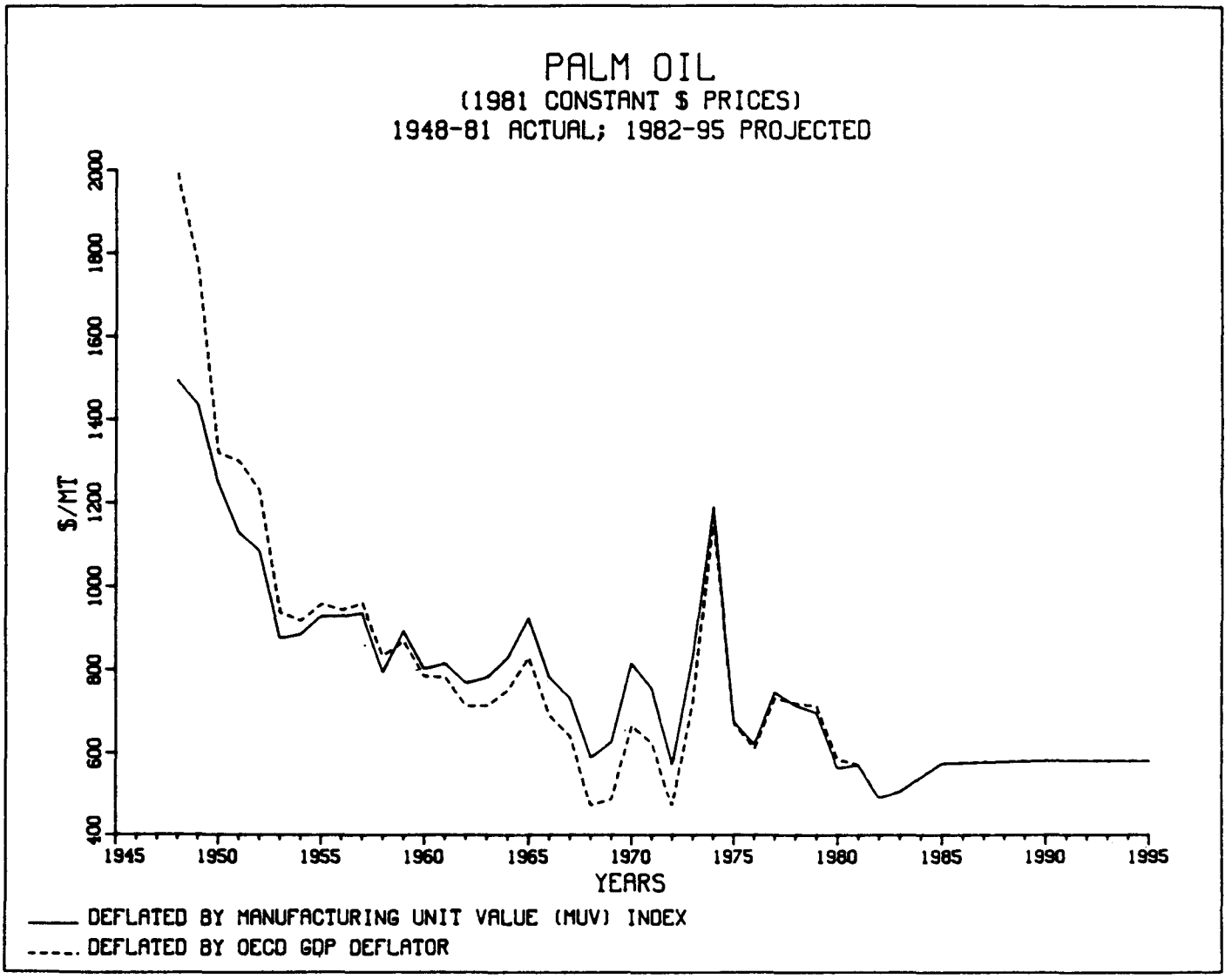
IMPACT EVALUATION REPORT

MALAYSIA

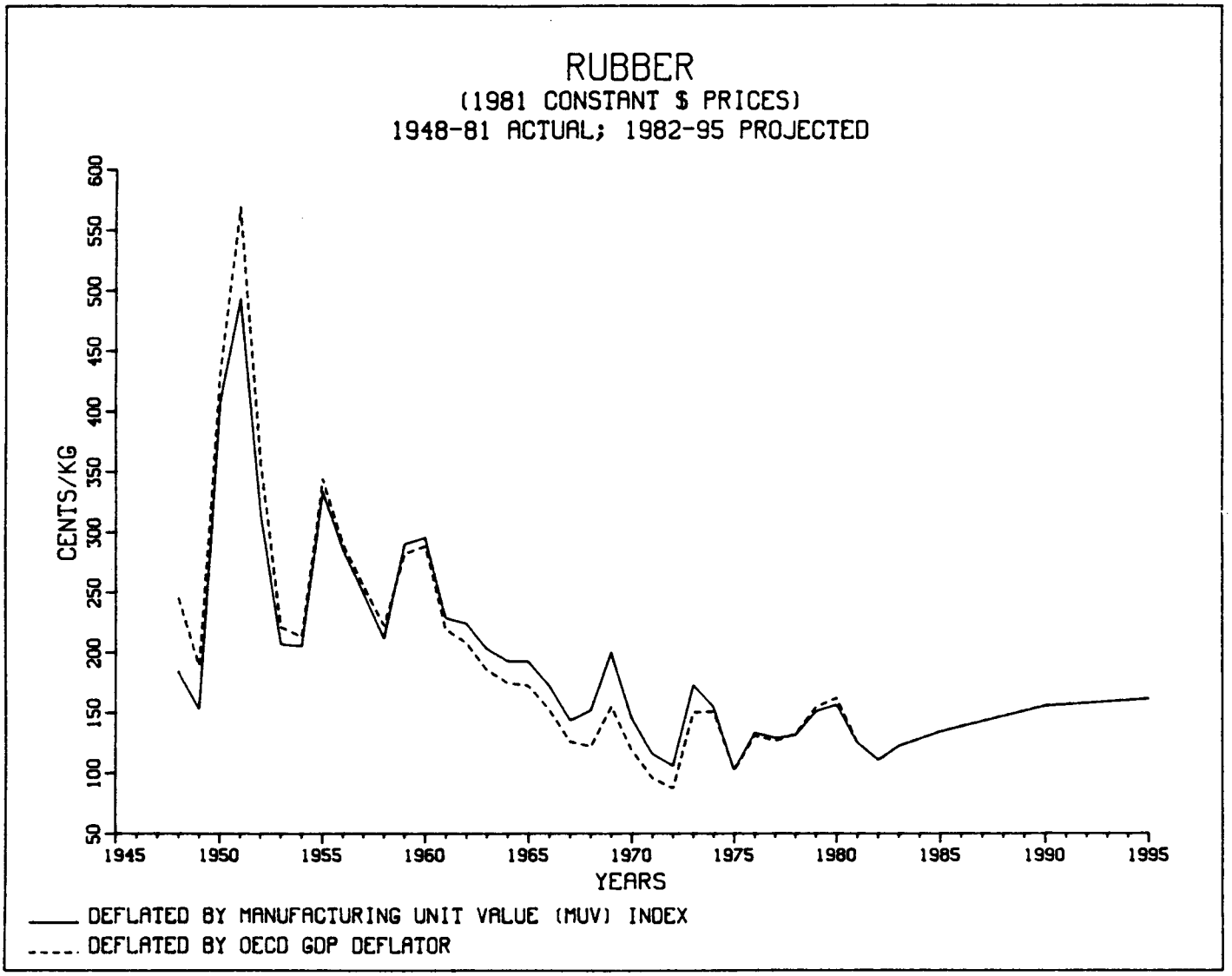
JENGKA TRIANGLE PROJECTS

Kernel Extraction Rate
(% of ffb)

	MILLS				
	Ulu Jempul	Jengka 4	Jengka 9	Jengka 18	Average
1974	3.14	2.50	-	-	2.82
1975	2.45	2.50	-	-	2.47
1976	3.46	3.08	3.11	-	3.22
1977	3.49	3.37	3.05	-	3.30
1978	3.96	3.27	3.64	-	3.62
1979	3.51	3.36	3.71	2.89	3.37
1980	3.02	3.73	3.31	3.45	3.37
1981	3.76	3.64	3.64	3.33	3.59
1982	3.73	3.63	3.85	4.55	3.94
1983	4.51	5.03	4.39	4.55	4.62
1984	4.88	4.86	4.38	4.08	4.55



Source: Price Prospects for Major Primary Commodities, Vol. II, July 1982.



Source: Price Prospects for Major Primary Commodities, Vol. III, July 1982.

ANNEX 3: SOCIAL IMPACT

Table 1: AGE OF SETTLER WHEN FIRST JOINING FELDA

LOCALITY	AVERAGE AGE YEARS	PERCENTAGE SETTLERS IN THE FOLLOWING AGE GROUPS WHEN FIRST JOINING FELDA						
		Below 20	21-25	26-30	31-35	36-50	41-50	51 & over
Jengka Stage I		1.4	23.2	37.2	23.2	13.0	1.4	-
Jengka Stage II		2.6	22.4	31.6	30.3	11.8	1.3	-
Jengka Stage III		3.6	14.3	40.5	20.2	10.7	9.5	1.2
Total		2.6	19.7	36.7	24.5	11.8	4.4	0.4

Table 2: LAND AREA OWNED PRIOR TO JOINING FELDA

Area owned in acres	Total	Jengka Stage I	Jengka Stage II	Jengka Stage III
Zero	72.1	66.7	72.4	76.2
Less than one acre				
1-1.9	2.2	1.4	3.9	1.2
2-2.9	4.4	1.4	5.3	6.0
3-3.9	4.8	4.3	3.9	6.0
4-4.9				
5-5.9	16.6	26.1	14.5	10.7
6 & over				

Table 3: Settler and Wife's Main Occupation Prior to Joining Scheme

Main Occupation	Percentage Reporting	
	Settler	Wife
Not working; unemployed	3.0	83.4
Trade, small busines	3.9	1.3
Padi planting	24.9	6.1
Rubber tapping	31.0	5.6
Oil palm plantation worker	5.7	1.3
Laborer, odd job worker	20.1	2.2
Fisherman	1.7	-
Ex-serviceman	1.7	-
Government servant	2.2	-
Others	5.9	0.1

Table 4: Average Monthly Income Earned by Settler Prior to Joining FELDA

Monthly Income	% Settlers Reporting		
	All settlers	Oil Palm Settlers	Rubber Settlers
1-49	1.3	1.3	1.3
50-99	0.8	0.7	1.2
100-149	15.3	20.5	6.0
150-199	26.6	24.0	31.3
200-249	19.2	17.1	22.9
250-299	7.4	4.8	12.0
300-349	14.0	15.0	9.6
350-399	3.0	4.1	1.2
400-449	2.2	1.4	3.6
500-900	4.8	4.8	4.8
Average Monthly Income US$	211		

ANNEX 3.2

Place of Origin /a of Settlers

Place of Origin of Settlers	Type of Settlers: % Reporting		
	Total	Oil Palm Settlers	Rubber Settlers
Johor	6.1	5.5	7.2
Kedah	15.3	13.0	19.3
Kelantan	12.2	13.0	10.8
Melaka	1.7	2.7	0
Negeri Sembilan	2.2	2.7	1.2
Pahang	23.6	17.1	34.9
Perak	13.1	14.4	10.8
Pulau Pinang	3.4	5.4	1.2
Selangor	14.9	15.8	13.3
Terengganu	4.8	6.8	1.2
Perlis	2.2	3.4	--

/a Place of origin is the place of residence at time of application to join FELDA.

ANNEX 3.3

Table 1: Average Household Size

Type of Settler	Average Household Size	% Households in the Following Household Size								
		1	2	3	4	5	6	7	9	10	10 & over
Oil Palm	6.7	-	0	3.4	8.2	12.3	26.7	15.1	16.4	11.0	6.8
Rubber	5.9	-	2.4	4.8	16.9	20.5	19.3	6.0	3.6	6.0	6.0
Total	6.4	-	0.9	3.9	11.4	15.3	24.5	16.6	12.7	8.3	6.6

Table 2: Age of Settler in 1985

Type of Settler	Average Age	% Settlers in the Following Age Groups				
		21-30	31-40	41-50	51-60	60 & over
Oil Palm	47	4.1	53.4	38.4	3.4	0.7
Rubber	38	14.5	47.0	37.3	1.2	0
Total	44	7.9	51.1	38.0	2.6	0.4

ANNEX 3.4

Settlers' Perception of Social Infrastructure and Quality of Life

Infrastructure	Settlers' Rating: % Settlers Reporting						
	Very Good	Good	Unsatis-factory	Bad	Not Avail-able	Not Nec-essary	Do not Know
Community Center	2.6	77.3	17.9	0.5	-	-	1.7
Primary School	3.9	88.6	4.8	0.4	-	0.4	1.7
Secondary School	3.5	56.3	10.0	0.4	19.7	0.4	9.2
Religious School	2.6	80.8	10.0	0.9	2.2	0.4	2.6
Kindergarten	0.9	87.3	7.0	-	0.9	0.9	2.6
Mosque	5.2	90.0	3.1	-	-	-	1.3
Maternity Clinic	1.7	79.5	14.0	1.3	1.7	-	1.3
General Clinic	1.3	51.5	13.1	1.7	29.7	0.4	1.7
Private Clinic	-	20.1	3.1	0.4	66.8	0.9	8.3
Govt. Hospital	0.4	21.4	9.6	0.9	59.4	0.4	7.0
Water Supply	3.1	51.1	37.6	7.0	0.9	-	-
Electricity Sup.	-	17.9	19.7	5.7	55.0	-	-
FELDA Shop	0.9	75.1	19.2	1.7	2.2	-	0.4
Provision Shops	-	61.6	17.5	0.9	4.8	-	1.7
Eating Shops	0.4	85.6	8.3	-	1.3	0.4	3.5
Roads within Scheme	1.7	31.9	55.9	9.6	0.4	-	-
Roads from Scheme to Town	1.3	69.4	27.1	1.3	0.4	-	-
Cinema	-	2.6	0.9	0.4	72.1	22.7	0.9
Children's Playground	-	40.6	24.5	3.5	25.3	1.3	4.4
Games and Sports Facilities	-	75.5	15.3	1.7	1.7	1.3	4.4
Women's Institute	-	67.2	14.8	-	4.4	0.4	13.1
Youth Brigades	-	52.0	23.6	0.9	11.4	0.9	11.4
Postal Services	3.1	61.6	29.7	3.5	0.4	-	1.3
Telephone	0.4	12.2	15.3	3.1	68.1	-	0.9
Bank	-	37.1	8.7	-	50.7	0.4	3.1
Information Services	-	50.7	28.8	4.4	7.9	0.4	7.9
Environment	0.4	51.5	35.4	6.1	2.6	-	3.9
Transport to School	0.9	58.5	16.2	0.9	18.8	0.4	4.4
Transport to Shopping Ctr.	0.4	29.7	17.5	0.9	48.0	2.2	1.3
Transport to Work	04	19.7	10.5	0.4	57.2	9.2	2.6

ANNEX 3.5

FELDA's Progress and Settlers' Expectations Before Joining FELDA

	% of Settlers Reporting											
	All Settlers				Oil Palm Settlers				Rubber Settlers			
	Very Good	Good	Unsatis-factory	Bad	Very Good	Good	Unsatis-factory	Bad	Very Good	Good	Unsatis-factory	Bad
Raising Levels of Income	11.8	76.0	11.8	0.4	11.6	84.2	4.1	0	12.0	61.4	25.3	1.2
Improving Quality of Rural Life	7.0	83.8	8.9	0.4	7.5	86.3	6.2	0	2.2	79.5	13.3	1.2
Job Opportunities within Scheme for Children	1.3	59.6	34.2	4.4	2.1	62.1	30.3	4.8	0	55.4	41.0	3.6
Providing Housing	2.6	76.0	19.7	2.1	4.1	78.1	15.8	2.1	0	72.3	26.5	1.2
Health Services	1.7	70.3	24.5	3.5	2.1	74.7	19.2	4.1	1.2	62.7	33.7	2.4
Living in a Clean Environment	1.3	72.1	24.0	2.6	2.1	73.2	21.9	2.8	0	69.9	27.7	2.4
Unity among Settlers	7.9	82.5	8.7	0.8	6.8	88.4	3.4	1.4	9.6	72.3	18.1	0

ANNEX 3.6

Most Important benefits of Being a FELDA Settler:
Percentage Settlers Reporting

Possible Benefits	% Settlers Reporting		
	Oil Palm	Rubber	All
1. Improved House	20.0	14.5	18.3
2. Vehicle Ownership	4.8	1.2	3.5
3. Household Facilities, T.V.	0.7	0	0.4
4. Education of Children	34.0	36.0	35.4
5. Health Services	0.7	2.4	1.3
6. Clean Water	0	0	1.8
7. Roads and Transportation	0	3.6	1.3
8. Community Centers and Facilities	2.7	1.2	2.2
9. Future Ownership of House	5.5	10.8	7.4
10. Fugure Ownership of Land	13.1	18.1	14.4
11. Guaranteed Minimum Income	17.8	12.0	15.7
12. Non-agricultural Job Opportunities	0	0	0

ANNEX 3.7

Table 1: Settlers' Preferences of Their Future Type of Farming Organization After Loan Repayment and at Time of Replanting

Type of Settler	% of Settlers Who After Repayment and at Replanting would like to: Remain in the FELDA System	Be Independent of FELDA
Oil Palm Settlers	73.1	26.9
Rubber Settlers	63.4	36.6
Total	69.6	30.4

Table 2: Type of Tenurial Arrangements Preferred by Settlers

Type of Settler	% Settlers who would prefer their tenurial arrangement to be: Individual Land Title	Block Land Title	Share of the Scheme	Leave the Scheme
Oil Palm Settlers	69.2	28.6	1.4	0.7
Rubber Settlers	92.7	4.9	2.4	0
Total	77.6	20.2	1.8	0.4

ANNEX 3.5

Table 1: Work Aspirations of Settlers

Type of Settler	Aspirations of Settlers: % Settlers Reporting					
	Go into Business	Fulltime Work with	Work in FELDA & Outside	FELDA Settler and Open Business	Leave Scheme and Work Elsewhere	Retire and Leave Farm to Children
Oil Palm Settler	19.9	19.9	9.6	24.7	0.7	24.7
Rubber Settler	19.3	18.1	12.0	24.1	1.2	24.1
Total	19.7	19.2	10.5	24.5	0.9	24.5

Table 2: Settlers' Aspirations for Children Living in Scheme

Type of Settler	Aspirations of Settlers with Regard to Their Children: % of Settlers Reporting		
	Live and Work in the Scheme/ Agricultural Work	Do Other Work on Scheme: Commercial Activity	Migrate Out of the Scheme
Oil Palm Settler	26.6	13.3	60.1
Rubber Settler	27.2	13.6	59.3
Total	26.8	13.4	59.8

Table 3: Children Who Migrate Out of the Scheme - Type of Work They Intend to do

Type of Business	% Who Prefer Children to Migrate Out Of Scheme	Preferred Work for Children Who Migrate Out: % Settlers Reporting					
		Business	Government Employment	Work in Private Sector	Farm in New Place	Join FELDA Scheme in New Area	Other
Oil Palm Settlers	60.1	26.7	47.6	6.7	1.9	3.8	13.3
Rubber Settlers	59.3	16.1	57.1	7.1	1.8	7.1	10.7
Total	59.8	23.0	50.9	6.8	1.9	5.0	12.4

ANNEX 4: FINANCIAL IMPACT

ANNEX 4.1

Jengka Scheme	Provision Shops	Coffee Shops	Stationery News Vendors	Motor Workshops	Barber Shops	Tailors	Fish Vegetables	Petrol	Hardware	Others	Total
Jengka 1	10	3	1	1	-	-	-	-	-	-	15
Jengka 2	8	5	2	1	2	1	2	-	-	-	21
Jengka 3	7	6	-	2	1	1	2	2	1	1	23
Jengka 4	9	3	1	3	1	1	-	3	-	-	21
Jengka 5	6	3	-	1	1	1	-	-	-	-	12
Jengka 6	11	6	-	-	-	1	-	-	1	-	19
Jengka 7	10	5	1	2	1	1	-	-	1	-	21
Jengka 8	14	6	-	1	1	2	-	-	2	1	27
Jengka 9	5	3	-	1	1	-	1	-	-	1	12
Jengka 10	6	4	1	1	1	-	-	-	1	-	14
Jengka 11	8	6	-	2	1	-	3	-	-	-	20
Jengka 12	11	5	-	3	1	1	-	-	1	-	22
Jengka 13	14	4	1	4	1	1	-	-	1	-	26
Jengka 14	8	4	-	3	-	2	-	-	1	-	18
Jengka 15	15	3	1	1	-	1	-	-	1	-	22
Jengka 16	10	2	-	2	1	1	-	-	2	-	18
Jengka 17	5	3	-	2	2	-	-	-	1	-	13
Jengka 18	11	3	1	2	1	-	2	2	-	-	22
Jengka 19	11	9	-	3	1	2	2	1	1	-	30
Jengka 20	7	3	-	1	1	2	1	-	1	-	16
Jengka 21	9	2	-	2	1	-	-	-	-	-	14
Jengka 22	10	4	-	1	1	1	6	1	1	-	25
Jengka 23	12	2	-	2	3	1	1	-	1	-	22
TOTAL	217	94	9	41	23	20	20	9	17	3	453

CASE STUDY OF A GENERAL GROCERY SHOP

Encik X occupies one of the end lots and the block of five shops built by FELDA in the business square of Jengka Scheme No. 2. The shop is of the usual standard size 60 feet by 20 feet and the current rental is $30 per month. FELDA built in 1970 only one block of five shops in scheme No. 2. The shop is of half brick with a wooden frame and its appearance will be considerably improved with painting and repairs which are long overdue.

Encik X, wife, and son aged 15 operate the shop and live in the premises. His settler house which is nearly one mile away is occupied by a distant relative and family who do the field work in Encik X's oil palm plot. Encik X pays the relative $300 per month for this help in the farm work. This arrangement whereby Encik X and family concentrate on the general grocery shop while the work on the oil palm lot is attended to by the hired workers has been going on since 1974, after 3 years in the scheme. The standard of work on the agricultural lot has been satisfactory and Encik X has not received any warning letter or been reprimanded for poor field maintenance by the FELDA field staff. The field staff report that hired workers make it a point to comply with the cultivation standards that are required by FELDA.

Encik X and wife are from Kelantan. Approximately 7 out of the 30 shop-lots in Jengka Scheme No. 2 are operated by settlers from Kelantan, a state where the local men and women are active in small businesses as the productivity from agriculture is low. However, neither parents of Encik X and wife were engaged in business and therefore they have had no previous business experience. Encik X was a trishaw-peddler in Kota Baru prior to joining the scheme and was earning $3 to $5 per day. Their ties with people in Kelantan are being fully utilized to earn supplementary income and this will be explained later. Both husband and wife had hardly completed their primary education. What made them go into business?

Both of them noticed very early after their arrival that a new land development scheme with 440 families had considerable potential for business; there were no other shopping areas in those days where the settlers could buy their daily requirements. The availability of a built shop was of great assistance. He had no savings to invest but a loan of $2,000 from MARA was sufficient. MARA has been the most important source of loan capital for Bumiputra businessmen and has a special program for this purpose. Profits have been ploughed back and the variety of goods sold is sufficient to meet the requirements of the limited number of customers from the scheme. The shop sells the typical goods in daily use: rice, sugar, cooking oil, cigarettes, condensed milk and milk powder, tooth paste, talcum power, soaps, detergents, torches and batteries, etc. Supplies are brought in by itinerant traders in travelling vans who come mainly from the nearby small towns but

goods who specialize in the products they distribute for there are separate vendors for cigarettes, milk products, plastic goods, biscuits, spices and general goods, etc.

Encik X has his business dealings with a small number of them. He could obtain his stocks on credit but he prefers to make cash payments for he believes that he could get the best offers in this way. All his goods are supplied by individual chinese wholesale suppliers and he is satisfied with both the price and quality of the goods supplied. These distributors have served a large number of settler shops in Jengka and elsewhere and they in turn obtain their goods from larger wholesalers. Thus these goods pass through a number of middlemen and the price could be lowered if there is direct distribution from the wholesalers and importers. This will involve purchases in large quantities e.g., a lorry load of rice. But Encik X's business is small and he faces severe competition not only from other small shops but also from FELDA Corporation's large store.

FELDA Corporation stores are much larger with a wide variety of goods (a supermarket in the scheme area). They provide credit to settlers and by doing so, have drawn most settlers as its customers. This Corporation shop is supported by FELDA which makes deductions from the pay sheets for the credit given to settlers and there are therefore no bad debts. However Encik X because of personal ties and individual preferences has his regular customers of about 30 households. He provides limited credit to about 10 of them and in this way is able to meet the competition from the FELDA and other provision shops. An advantage of the private shop is that it is open from 8 a.m. to about 10 p.m. seven days of the week while the larger and better organized FELDA shop keeps to office working days and working times which are not always convenient for customers.

In addition to the usual items sold in a general grocery, Encik X also retails petroleum and engine oil to motorcyclists. He is one of four retailers of petroleum in the Jengka 2 area. With nearly every settler owning a motorcycle, there is a steady demand for fuel, although selling the item without some form of fire protection adds to the risks of business.

The daily turnover is modest and on average amounts to M$80 to M$100. This will provide him a net profit of about M$20. But he has other side-line incomes. Encik X maintains close ties with Kelantan, the state of origin of he and his wife. They now own a car and make a trip and sometimes two trips per month during the peak oil palm harvest season. The travelling costs are more than covered by small businesses that are undertaken in these trips; they bring from Kelantan sarongs, batik cloth, Thai fancy goods, silver and brass ware and jewelry and these are retailed to the women folk at the scheme level in installments with easy payments. There is a good profit margin although collection of small installments requires patience and trust and there are occasional bad debts. In April and November oil palm yields are high and the settlers receive maximum incomes. It is in these months that Encik X and wife will make two or more trips to Kelantan, for much of the increased incomes are used for the purchase of semi-luxury goods rather than set aside as savings in one of the many saving institutions that could be used by the settlers.

Percentage Settlers Who Have Improved or Renovated their House

Type of settler	% settlers who have improved house	% settlers who have not renovated house	Average total cost ($) of renovations, improvement
Oil Palm settlers	72.6	27.4	4,540
Rubber settlers	54.2	45.6	2,727
All settlers	65.9	34.1	3,939

Percentage Settlers Who Have Improved or Renovated their House by Stage of Development

	Stage I		Stage II		State III	
Type of settlers	% settlers who have improved house	($) Average cost of improve-ment	% settlers who have improved house	($) Average Cost of improve-ment	% settlers who have improved house	($) Average cost of improve-ment
Oil Palm settlers	78.9	6,035	88.8	4,155	47.7	2,069
Rubber settlers	100.0	5,208	61.3	2,382	31.8	1,066
All Settlers	82.6	5,861	77.6	3,584	41.6	1,725

Expenditure on Renovations: Percentage Settlers Reporting

Expenditure on renovations (M$)	% settlers reporting
Less than 2000	38
2001- 4000	31
4001- 6000	13
6001- 8000	8
8001-10,000	4
Over 10,000	6
Total	100

MALAYSIA - FIRST, SECOND AND THIRD JENGKA TRIANGLE PROJECTS
(LOANS 533, 672 AND 885-MA)

Ownership of Selected Assets by Type of Settlers

	Oil palm settlers		Rubber settlers	
	% reporting	Purchase price (M$)	% reporting	Purchase price (M$)
Car, van	23.9	10,240	13.2	5,136
Motor cycle	93.2	1,692	95.2	1,335
Bicycle	46.6	178	20.5	135
Radio, Transistor	82.8	186	71.1	165
T.V. Black & White	63.0	1,021	67.5	938
T.V. Color	37.6	1,655	14.5	1,645
Video	1.4	1,440	-	-
Sewing machine	58.9	582	36.1	578
Refrigerator	7.5	1,242	1.2	1,200
Electric iron	19.9	39	8.4	41
Electric fan	24.7	118	14.5	133
Jewelry	20.5	646	14.5	400
Gas cooker	6.9	502	27.7	702
Lounge set	37.5	502	27.7	702

ANNEX 5: INSTITUTIONAL IMPACT

Table 1: ATTITUDE OF SETTLERS TOWARD SCHEME DEVELOPMENT COUNCILS (JKKR)

Type of Settler	% of Settlers Reporting that JKKR are	
	A FELDA Organization	A Settler Organization
Oil Palm Settlers	30.9	69.1
Rubber Settlers	28.8	71.2
Total	30.1	69.9

Table 2: Usefulness of Scheme Development Councils

Objective	% Settlers' View that JKKR are			
	Very Good	Good	Unsatisfactory	Bad
Organizing Work	12.7	70.2	14.0	3.1
Expressing Settlers' Suggestions	10.5	70.2	17.1	2.2
Organizing Social Activities	8.8	76.2	11.9	3.1

Table 3: Preference of Settlers in the Decision Making Process on Selected Topics

Selected Topics	% Settlers Stating Preference that Decision Making Should be by:				
	FELDA's Decision/ Guidelines	Group Leader	General Concensus	Individual Decision	No Response
Day-to-Day Operations	23.6	28.6	47.6	--	--
Short-term Planning	32.2	36.5	30.6	--	--
Investment Decision	49.8	3.5	12.2	0.4	34.1

Participation in Settler Organizations and Associations

Settler Organization	% Settler Households Participating	% Participants Who Are Committee Members	% Oil Palm Settlers Participating	% Rubber Settlers Participating
Settler's Development Committee	87.7	11.8	88.3	86.6
Community Centers	49.1	4.2	55.5	37.8
Parent-Teachers' Assoc.	76.8	6.3	80.8	69.5
Women's Institutes	74.6	8.8	74.7	74.4
Youth Brigade	48.5	3.8	69.2	30.8
Mosque Committee	49.1	9.8	52.7	42.7
Political Organization	42.1	7.3	43.2	40.2
Cooperatives	75.9	5.9	84.8	60.2
Others	7.4	2.2	6.1	9.4

Table 1: Variations in Systems of Decision Making in Block Organization

No.	Variations	% Reporting
1.	Decided by FELDA Staff	7.9
2.	Decided by Block Leader	14.9
3.	General Concensus	76.5
4.	Decided Individually	0.7

Table 2: Working Pattern in Block Management System (Oil Palm Schemes)

Type of Settler	% Settlers Reporting Working Pattern Being			
	Always Individually	Mostly Individually	Occasionally Individually	Never Individually
Oil Palm Settler	55.6	29.8	11.9	2.9

Table 3: Views of Farmers on Fairness of Sharing of Work Loan in the Block System

Type of Settler	% Settlers Reporting that all Members of the Group Share the Work Load Fairly			
	All the Time	Often Fair	Mostly not Fair	Not Fair
Oil Palm Settler	21.2	68.9	8.6	1.3

Table 4: Settlers' Attitude towards Block Management (Oil Palm Schemes)

Type of Settler	Views of Settlers towards Group Working System: % Settlers Reporting			
	Very Good	Good	Unsatisfactory	Bad
Oil Palm Settler	11.3	76.8	9.3	2.6

Table 1: Settlers' Perception of FELDA

Type of Settler	% Settlers Who Perceive FELDA as An Equal Partner	A Technical Adviser	An Employer	A Father Figure
Oil Palm Settler	8.2	13.7	25.3	52.7
Rubber Settler	18.2	15.7	27.7	38.2
Total	11.8	14.4	26.2	47.6

Table 2: Familiarity With How Incomes Are Computed

Type of Settler	Understanding of How Incomes Are Computed % Settlers Reporting Clearly Understand	Often Clear	Mostly Not Clear	Never Understand
Oil Palm Settler	18.5	40.4	22.6	18.5
Rubber Settler	27.7	30.1	26.5	15.7
Total	21.8	36.7	24.0	17.5

Table 3: Settlers' Ranking of Their Current Status As FELDA Settler

Type of Settler	% Settlers Reporting Very Good	Good	Unsatisfactory	Bad
Oil Palm Settler	9.6	80.7	9.0	1.4
Rubber Settler	6.0	69.9	21.7	2.4
Total	7.9	76.9	18.6	1.8

Table 4: Settlers' Perception of FELDA's Control of their Daily Activities

Type of Settler	% Settlers Who Feel that FELDA's Control of Daily Activities is Too Strong	Sufficient	Not Sufficient
Oil Palm Settlers	8.4	81.9	9.6
Rubber Settlers	4.8	90.4	4.8
Total	6.1	87.3	6.6

Training Courses Attended by Settler and Family Members

Training Courses Attended	% Settler Households Reporting	Location of Course % Households Reporting			Organizers of Course % Households Reporting			
		In Scheme	In Jengka	Outside Jengka	FELDA	Government Agencies	Voluntary Organizations	Others
Orientation Course	61.0	52.4	3.9	4.8	61.0	-	-	-
Leadership Course	13.5	7.4	3.1	3.1	10.9	0.9	0.9	0.9
Treasurer's Course	7.4	3.9	2.2	1.3	6.6	0.4	0.4	-
General and Farm Management	7.4	3.1	1.3	3.5	4.4	1.7	1.7	-
Religious Courses	16.9	12.7	3.1	3.9	11.8	2.2	5.2	0.9
Transportation	1.7	0.9	0.9	0.4	1.7	0.4	-	-
Capital Investment	1.3	-	0.9	-	0.4	0.4	-	-
Business	6.1	1.3	1.7	3.1	2.6	2.6	0.4	0.4
Home Economics	13.0	10.0	2.6	0.4	11.4	1.3	0.4	-
Others	8.3	2.2	0.9	5.7	0.4	5.7	1.3	0.9

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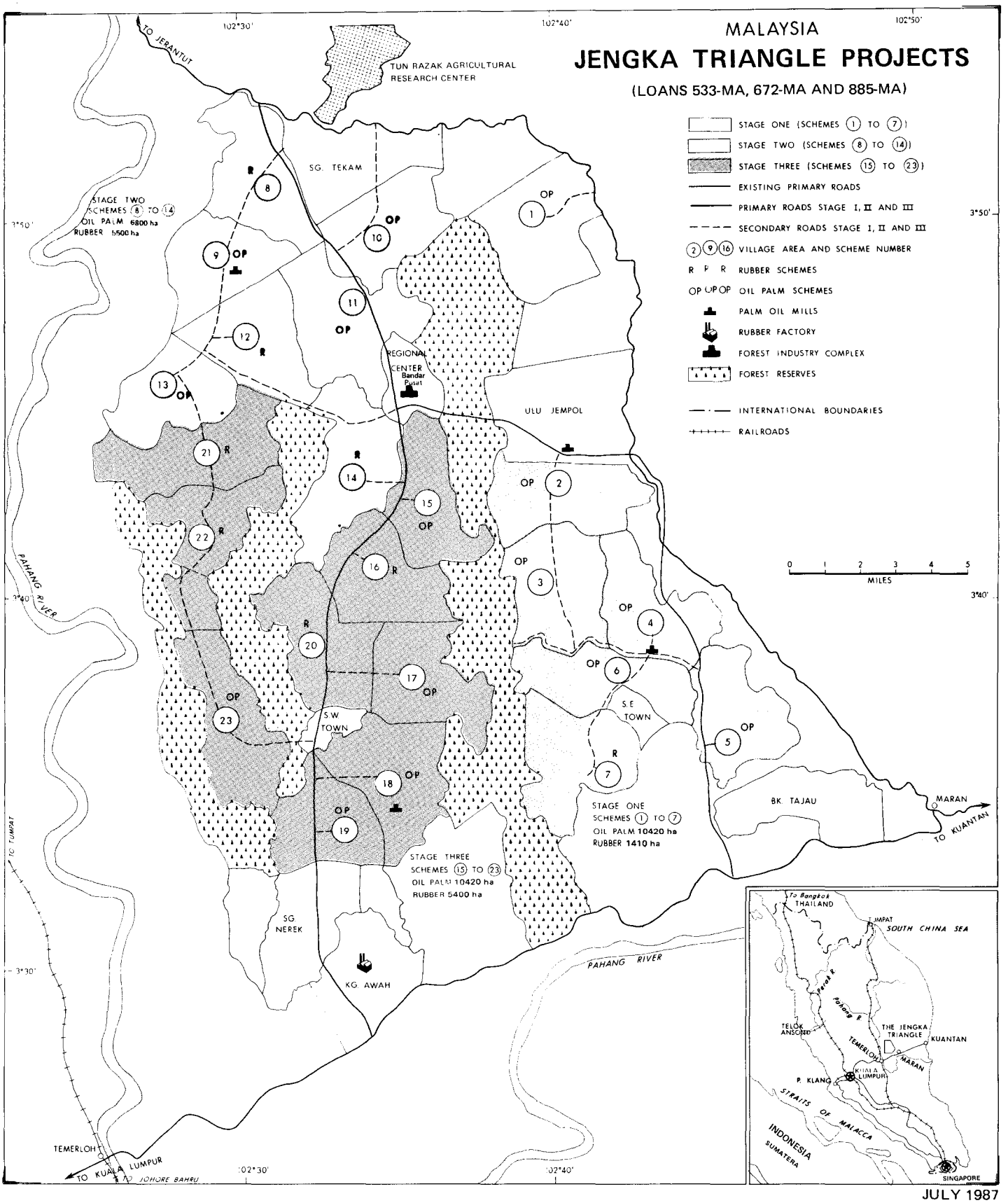
MALAYSIA
JENGKA TRIANGLE PROJECTS
(LOANS 533-MA, 672-MA AND 885-MA)
STAGE ONE (SCHEMES 1 TO 7)
STAGE TWO (SCHEMES 8 TO 14)
STAGE THREE (SCHEMES 15 TO 23)
EXISTING PRIMARY ROADS
PRIMARY ROADS STAGE I, II AND III
SECONDARY ROADS STAGE I, II AND III
VILLAGE AREA AND SCHEME NUMBER
R R R RUBBER SCHEMES
OP OP OP OIL PALM SCHEMES
PALM OIL MILLS
RUBBER FACTORY
FOREST INDUSTRY COMPLEX
FOREST RESERVES
INTERNATIONAL BOUNDARIES
RAILROADS
TUN RAZAK AGRICULTURAL RESEARCH CENTER
TO JERANTUT
SG. TEKAM
REGIONAL CENTER Bandar Pusat
ULU JEMPOL
S.W TOWN
S.E TOWN
8K TAJAU
MARAN
TO KUANTAN
SG NEREK
KG. AWAH
PAHANG RIVER
TO TUMPAT
TEMERLOH
TO KUALA LUMPUR
TO JOHORE BAHRU
STAGE TWO SCHEMES 8 TO 14 OIL PALM 6800 ha RUBBER 5500 ha
STAGE ONE SCHEMES 1 TO 7 OIL PALM 10420 ha RUBBER 1410 ha
STAGE THREE SCHEMES 15 TO 23 OIL PALM 10420 ha RUBBER 5400 ha
102°30'
102°40'
102°50'
3°50'
3°40'
3°30'
0 1 2 3 4 5 MILES
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Pahang R.
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JULY 1987

The World Bank

Headquarters
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Telephone: (202) 477-1234
Telex: WUI 64145 WORLDBANK
RCA 248423 WORLDBK
Cable Address: INTBAFRAD
WASHINGTONDC

European Office
66, avenue d'Iéna
75116 Paris, France

Telephone: (1) 47.23.54.21
Telex: 842-620628

Tokyo Office
Kokusai Building
1-1 Marunouchi 3-chome
Chiyoda-ku, Tokyo 100, Japan

Telephone: (03) 214-5001
Telex: 781-26838

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