Prospects for agricultural development in Indonesia

With special reference to Java

PROEFSCHRIFT

ter verkrijging van de graad van doctor in de landbouwwetenschappen op gezag van de Rector Magnificus, Dr. Ir. F. HELLINGA, hoogleraar in de cultuurtechniek, te verdedigen tegen de bedenkingen van een commissie uit de Senaat van de Landbouwhogeschool te Wageningen op vrijdag 22 maart 1968 te 16.00 uur

1968 *Centre for Agricultural Publishing and Documentation*

Wageningen

POSTULATES

I

The absence of a clear doctrine in the agrarian policy of many developing countries, in particular towards the small farmer, retards agricultural expansion.

This thesis.

II

In the process of economic growth, development in agriculture and in the other sectors of the economy are closely linked.

This thesis.

III

Effective economic planning needs adequate statistics. For Indonesia this implies that all relevant data should be transferred to the Central Bureau of Statistics. To fulfil its task, this Bureau needs appropriate expansion.

IV

To exploit its minerals, to raise farm yields, to increase the output of its workers, and to launch new industries, a country must know its resources.

Report and Recommendations of the US Agencies for International Development, Atlas of Indonesian Resources, Djakarta 1962, p. 1.

V

Whether industrializing from an advanced or from a primitive agriculture society, there is never a place for agricultural protectionism at any stage of development.

F. LIST, Das nationale System der politischen Oekonomie, 6. Aufl., Stuttgart 1877, S. 276–280.

VI

In developing countries the financial appraisal of a project is of more importance than the so-called economic one.

VII

Sustained growth of agriculture in developing countries can only be achieved if the farmers are convinced that they can benefit substantially from agricultural science. It is incorrect to assume that quicker results will be reached by compulsion, but in special situations this may temporarily be unavoidable.

VIII

The purpose of sociology is to find the characteristics of the society. For agricultural development the characteristics should not be ignored or contravened, but mobilized and activated.

IX

As agronomy, sociology has to test results found in one place before applying them elsewhere.

X

A national plan for agricultural development without guidance from farm management research and extension is like a big schooner without wind in its sails: it is beautiful to look at but it is not getting anywhere.

R. SCHICKELE, Farm management research for planning agricultural development. Indian Journal of Agricultural Research 31 (2), 1966, pp. 10–11.

XI

The essence of farm management is the use of facts and logic to make decisions on farming operations, instead of making them on the basis of emotion and tradition.

O. J. WHEATLY, The role of farm management in developing economics. Proceedings of the National Centre on Farm Management, Rawalpindi, Pakistan, June 1962, p. 20.

XII

It is realistic to base foreign aid on mutual profit.

Proefschrift van ir. SIE KWAT SOEN
Wageningen, 22 maart 1968.

To my parents

To my wife

This thesis will also be published as Agricultural Research Reports 705

Acknowledgements

Without the assistance of many persons and institutions this work would never have been possible.

My special thanks are due to Professor J. H. L. JOOSTEN, who not only accepted this paper as a doctoral thesis but whose guidance and patience have supplied an invaluable contribution to its final shape.

I am most grateful to my country, the Republic of Indonesia, for the opportunity its government has given me to complete this study.

Without the generosity of the Agricultural Development Council, New York, for the financial support to carry out my work in the Netherlands, this paper would never have been published. I am most grateful to Professor H. BEERS and Professor P. GITTINGER for their assistance in this matter.

The Centre for Agricultural Publications and Documentation (Pudoc) in Wageningen helped financially in the publishing of this study for which I am thankful to Mr. A. RUTGERS. My thanks are to the officials of this organization for their technical aid, in particular to Dr. E. MEIJER DREES for helping me to prepare the manuscript for the press.

Professor E. DE VRIES has guided me in my study during the illness of Professor JOOSTEN, and provided much of the material for my study. I benefited considerably from the information and suggestions supplied by Professor J. TINBERGEN (Rotterdam), Professor O. SCHILLER (Heidelberg), Professor CH. PROU (Paris), Professor GUNNAR MYRDAL (Stockholm), Professor COLIN CLARK (Oxford), Dr. D. WIGHTMAN (Birmingham), and Dr. E. F. SZCZEPANIK and Dr. E. H. JACOBY of FAO Headquarters (Rome). My appreciations go to all of them for their valuable help.

It is a pleasant duty to me to thank Professor TOJIB HADIWIDJAJA and Professor M. HILLE RIS LAMBERS who have always encouraged me in my study, and Professor TH. L. M. THURLINGS and Ir. R. A. L. LINCKLAEN ARRIËNS in Wageningen for their useful lectures.

My deepest thanks are also due to Mr. R. J. SMITH and Mr. D. J. COLMAN who have helped me with the English language and especially to Mrs I. PALMER in improving the style and the grammar. She provided extensive and detailed comments and criticism, several of which could be incorporated into the text.

The library staff members of the Agricultural State University (Wageningen), the Institute of Social Studies (The Hague), the Royal Institute of the Tropics (Amsterdam), and the Netherlands Economic Institute (Rotterdam) provided me with the material needed for the study; their assistance is much appreciated.

My gratitude is due to the various agencies of my government, in Indonesia and in the Netherlands, which have provided me with almost all the necessary basic material. I must also thank Ir. SUTIKNO EKADJAJA for sending me the material from Indonesia as quickly as possible.

Acknowledgements are also due to my colleagues in various government agencies in Indonesia who, during my absence, have carried on my former work there.

I would like to express my gratitude to the International Agricultural Centre, Wageningen, especially to Ir. C. J. VAN BIJLERT, who has helped to make my stay and that of my wife in Wageningen more pleasant, and to the personnel of the departments of the Agricultural University residing at Diedenweg 18 (especially Miss E. J. VAN DIJK and Miss A. NOORDIJK) fot their assistance.

Preface

There exists much literature on agricultural planning, but there is a serious lack of detailed information in particular areas. This is also true for Indonesia.

I hope that this analysis of the situation in Indonesia may give a foundation on which to build the country's agricultural policy. Most of the material is from my own experience and represents the situation up to 1964. As the study is also for a doctoral thesis, some compromise has been necessary in the contents and the manner of presentation.

Although the official Indonesian place-names may now be preferred, English names have been used for both the Prewar and Postwar Periods. The name Indonesia has been used in preference to the Netherlands East Indies or Dutch East Indies.

Contents

1 Introduction

Due to the usually fertile soil (especially in Java), the prevailing warm and moist climate well-suited to agriculture, and the industriousness of the farmers, just before World War II Indonesia was practically self-supporting in primary articles of food, especially rice, Indonesia's staple. Since 1957, rice imports have risen to an average of about 1,000,000 tons, or 8 procent of the consumption, and it has cost the government about 100 million US dollars a year: a substantial drain on its foreign exchange holdings.[1]

Another fact is that Indonesia still depends on agriculture for over 60 percent of her foreign exchange earnings. After the war output of agricultural export crops, with the exception of rubber, decreased. But, unfortunately, in the last few years rubber production, Indonesia's main export commodity, normally accounting for a third to a half of its export earnings, also shows a decline.

The rapidly growing population of Java, and the impossibility to expand the agricultural area, have resulted in a further decline of the average farm size since World War II. As non-agricultural activities have shown themselves unable to absorb the increase of Java's population, the pressure on agricultural land in this island has become more and more severe.

Against this background, the need for replacement of food imports, for greater export of agricultural products and for a relief in the population pressure on land in Java, this study of prospects for increasing agricultural production has been undertaken.

The present study will focus its attention on specific measures taken, or to be taken, by the government to solve the problems outlined above. It also attempts to analyse why the government's efforts have, or have not, been up to expectations, to arrive at some basic conclusions. Next, the question of how effectively the government had used its agricultural resources is dealt with. Finally the author will try to indicate the perspectives for agricultural development in Indonesia. As two thirds of its population is concentrated in Java and the data for this island are more complete than those for the other islands, this study is primarily concerned with Java.

[1] Import of rice seems to have declined during 1965 and 1966. Rice output has been about 10 million tons in both years and it is possible that the time will come soon when the goal of selfsufficiency in rice production will be reached. Rice import for 1965 was 796,000 tons and for 1966 (up to 30 September) 223,000 tons. See D. H. PENNY and D. THALIB, Survey of recent development, *Bull. Indon. Econ. Stud. 6*, Febr. 1967, pp. 25–26.

Agriculture in Indonesia has two aspects: the usually small-scale peasant agriculture and the estate agriculture.

Peasant farming varies between the extensive type of shifting cultivation and the most intensive culture as exemplified by double cropping in Java and Bali. The concept of a small holding is a relative one, especially before the enactment of the Basic Agrarian Law of 1960[2]: the smallholder in one area of Indonesia may be considered a fairly large farmer in another area, depending on the local agricultural pattern, the crop or crops involved, the amount of available arable land and the type of land tenure. Generally hired labour is little used and not much capital is involved.

The peasant primarily produces basic food commodities for himself and his family. Besides that, he produces cash crops for local and export markets, depending on regional circumstances. For local marketing only surpluses are sold, which generally are small. Also the total amount of cash crop product per farmer is usually small. Nevertheless, the number of farmers is so great that their combined surpluses may be substantial.

Several crops raised by the farmers, both for consumption and for export are further processed by the farmer himself or in factories which purchase the crop. If such processing requires little, if any, capital or technical knowledge (as copra), this is done by the peasants themselves. If processing needs more capital and wider technical knowledge, the crude product is sold to processing enterprises, sometimes through a dealer. Examples are the remilling enterprises for the peasant's rubber and the processing of cassava-flour.

The large-scale production of world commodities on so-called estates is a commercial enterprise. Land, usually comprising a fairly large area, is obtained by renting uncultivated 'waste land' on a regular long-term basis or by purchasing it (in the old days) from the government (so-called 'particuliere landerijen'). Here labour is normally paid in money and substantial capital is employed. Estate agriculture, as a rule, is not limited to the cultivation of crops: in most cases, the crude product is processed in a factory connected with the estate. On the whole, modern and scientifically established methods of cultivation and processing are used. The estates produce cash crops for the international markets.

Another form of estate agriculture occurs in the production of sugar. Here the enterprise owns only the factory (mill) and rents its land from the farmers. Thus it would be better if the word factory be used here instead of estates. The same applies to a number of enterprises which process tobacco and other annual crops (such as cassava). The figures of production area and other economic data of the crops grown for these factories are included in the tables for the estate crops.

This study is primarily based on data collected from various publications, especially those of the Central Bureau of Statistics. But these statistics are not all equally reliable or complete. For example, no sufficiently detailed studies on the national income and

[2] The size of agricultural landholdings is restricted by this law.

its composition were available. Data from the population census, conducted in October 1961 are still being processed and only some of its results could be included.

Results of the agricultural census, executed in October 1963, were even more difficult to obtain. There are good data on production in particular sectors, on some elements of the balance of payments and on retail prices in Djakarta, compiled by the Central Bureau of Statistics. Some of the gaps could be filled by the author's own reports on the aspects of agricultural development planning which he drew up since he joined the Indonesian State Planning Bureau in 1952[3].

Although technical, political, social and other problems will be touched, the nature of this study is primarily economic. The problems of agricultural development are its central objective, and therefore agricultural considerations play a decisive role. Of course the author feels the limitations of such a presentation, but readers who are interested in Indonesian agricultural development in a broader context should consult other studies. The most important are included in the bibliography.

As to the set-up of this publication the following scheme has been followed.

Chapter 2 gives in brief the theoretical background of why agriculture should be developed and how this applies to the Indonesian situation. The next three chapters contain a brief description to the historical development of agriculture in Indonesia since 1815 up till now: Chapter 3 indicates the development of the whole of Indonesia with special emphasis on the islands outside Java (the so-called Outer Islands), Chapter 4 is focussed on the agricultural development in Java, and Chapter 5 treats the effects of population pressure in Java.

Chapters 6 to 9 describe the approaches, the policies and the measures adopted by the government to face the problems after World War II as outlined in the previous chapters. They briefly discuss the successive agricultural development plans launched after World War II (Chapter 6) and the measures to relieve pressure on land in Java by agricultural resettlement (Chapter 7); the attempts to increase agricultural exports and the rehabilitation of the sugar factories as an example are given in Chapter 8, whereas Chapter 9 discusses the measures to improve peasant's agriculture with special attention to rice production.

Chapter 10 analyses the significance of the failure of the agrarian policy of the Indonesian government to overall agricultural development in Java.

Chapter 11 identifies the need to integrate the agricultural development of Java in the economic development of the whole of Indonesia.

Finally Chapter 12 summarizes the main conclusions of the study.

[3] Most of these short studies are issued as Reports of the State Planning Bureau, which was abolished in 1959. These reports may be obtained at the Biro FINEK (Economic and Financial Bureau), Sekretariat Negara, Djakarta.

Because Indonesia has experienced a persistent inflation since World War II, exchange rates for hard currency have presented a problem. Since no exact data on this subject are available (the official rates do not represent the actual situation on the free market), it was attempted to make an estimate, though it is only a rough one for the years after 1960. The result is given in Table 1, which also includes a period before World War II.

Table 1. Exchange rates of the US dollar.[1]

	Official rate	Free market rate		Official rate	Free market rate
before 1934	2.50		1955	11.40	30.00
1934/1936	1.50		1956	11.40	32.00
1936/1940	1.80		1957	11.40	40.00
1945/1949	2.65		1958	11.40	60.00
			1959[4]	45.00	75.00
1949[2]	3.80	19.00	1960	45.00	100.00
1950	3.80	19.50	1961	45.00	150.00
1951	3.80	16.25	1962	45.00	250.00
1952[3]	11.40	20.00	1963	250.00	500.00
1953	11.40	25.00	1964	250.00	2,500.00
1954	11.40	28.00	1965	10,000.00	20,000.00

[1]Before World War II expressed in Dutch guilders.
[2]From September 20, 1949.
[3]From February 4, 1952.
[4]From August 25, 1959.

Source: Several publications.

2 Theoretical and factual starting points

The reasons for improving agriculture in developing countries have been discussed in detail by various authors[4]. Their standpoints can be briefly described by the following arguments, drawn up by MOSHER[5].

"*Firstly*, because it produces the food, much of the fiber, and many of the other industrial raw materials on which a rising level of living depends."

"*Secondly*, because it is such a large segment of the total production of each people that it needs to be made as efficient as possible."

"*Thirdly*, because in early stages of industrialization a great deal of industrial equipment needs to be imported and for many countries the export of agricultural products is an important potential earner of foreign exchange."

"*Fourthly*, because every kind of development depends upon investment, and most of this investment has to be financed by domestic savings. Since for many countries agriculture is the largest industry, it must be sufficiently productive to allow for the accumulation of capital out of agricultural earnings. This capital is needed both in making agriculture still more productive and in financing investment in other types of industry that the country needs."

"*Fifthly*, because if non-agricultural industry is to develop in a country it has to be able to sell its product. It has to be able to sell most of its products within the country. Most of the potential domestic purchases of industrial products get their livelihood from agriculture. If the net income of farmers are not high enough to allow them the purchase of industrial products in the form of consumer goods, the non-agricultural industries cannot prosper."

Though the economic plans for developing countries have invariably recognized the strategic role of agriculture, it is industry which has been expected to constitute the most dynamic element in economic growth. However, the experience in many countries has shown that they will not become genuinely industrialized without solving at the same time the agricultural problems. In the present social and economic setting of the world, economic development requires complementary growth in all major sectors of society and economy, which is not possible if industrialization means an increased

[4] J. H. L. JOOSTEN, Landbouwontwikkeling en macro-economische orde, *Landbouwk. Tijdschr. 76* (1964), pp. 122–124. See also: J. W. MELLOR, *The economics of agricultural development*, Ithaca, NY, 1966. A comprehensive literature study on this subject is given by J. GITTINGER, *The literature of agricultural planning*, Washington DC, 1966.

[5] A. T. MOSHER, *Agricultural development*, The Agricultural Development Council, New York 1963 (mimeographed), pp. 3–4.

burden for the farmers. But it is becoming more and more clear that there will not be a rapid economic development if there is not an expanded market for the increased produce, which only a developing non-agricultural sector can sustain. This means that, if an industrial sector is to emerge and further sustain itself, the agricultural sector must also increase its total output, right from the beginning.

But experience in some developing countries has shown that domestic food production failed to keep pace with the growth in population, or that supplies of raw materials for the newly established industries did not come forth in sufficient quantities. In some countries agricultural exports have even fallen short of the moderate growth in world demand. Foreign exchange expenditures on imported food and materials have increased and in some cases export earnings have declined. Industrial growth has consequently been impeded, either by the recurrent need to restrain domestic expenditures in order to dampen inflationary pressure on urban food supplies, or by shortages of imported capital equipment and industrial materials. It is a reflection of these experiences that current plans have generally given special attention to agricultural development, and, in particular, to food production and the foreign exchange implications of agricultural growth.

It should, however, be kept in mind, that in several countries the development of the economy has been retarded not only by economic disparities but also by poor administration, political unrest and political ideologies.

Table 2. Estimated income of Indonesians, by source (1939).

	Dfl. × 1,000,000			% of total			% from rural sector	Amount from rural sector
	Java + Madura	Outer Provinces	Indonesia	Java + Madura	Outer Provinces	Indonesia		
Foodcrops	518	258	776	39.7	36.0	38.4	100	776
Export crops	31	127	158	2.4	17.7	7.8	100	158
Livestock incl. poultry	71	32	103	5.4	4.4	5.1	100	103
Fisheries	10	7	17	0.8	1.0	0.8	100	17
Forestry	5	8	13	0.4	1.1	0.6	100	13
Plantations + mines, wages	78	73	151	6.0	10.2	7.5	100	151
Ditto, rent	22	–	22	1.7	–	1.1	100	22
Manufacturing	225	75	300	17.2	10.5	14.9	90	270
Government	98	54	152	7.5	7.5	7.5	66	101
Trade	105	30	135	8.0	4.2	6.7	80	108
Communications	21	8	29	1.6	1.1	1.4	–	–
Services	35	11	46	2.7	1.5	2.3	50	23
House rent	70	30	100	5.4	4.2	4.9	80	80
Professions	16	4	20	1.2	0.6	1.0	–	–

According to POLAK (cited by D. PAAUW, The tax burden and economic development in Indonesia, *Ekonomi dan Keuangan*, 1954, pp. 567). Included are only the Indonesians paying no income tax.

We know that there are severe limitations on the capacity of developing countries to do everything at once in view of the complementary nature of agricultural and industrial growth. But it is precisely this consideration which underscores the importance of developing agriculture in such a way as to both minimize its demand upon resources most needed for industrial development and maximize its net contribution to the capital required for general economic growth.

But it would be erroneous to suppose, that most developing countries did not recognize the importance of using their agricultural resources as effectively as possible.

There is no question about the political, sociological and economic importance of a large and serious program for increasing domestic agricultural production. The trouble, however, is that in meeting the objectives for which they are working, the governments forget the crucial position of the farmer himself in achieving agricultural development. In the end it is the farmer who has to realize the wanted increased production on his farm.

The central problem which determines the decisions of the government is not that the developing countries should increase domestic food production and agricultural exports, but how to accomplish an identity of purpose and common responsibility between the government and the farmers in this respect.

Primarily due to the non-existence of a clear-cut doctrinal concept of the governments' agrarian policy in many of the developing countries as regards the policital attitude towards the farmers, their efforts to achieve rapid agricultural development have been greatly wasted. This study on agricultural development in Indonesia will attempt to clarify this point.

Indonesia is one of the countries in which agriculture plays an important role in the economy (see Tables 2 and 3). This importance can be shown by several figures such as its share in national income, employment pattern and exports, which are illustrated in the following pages.

In making a detailed analysis of the Indonesian economy as earlier explained, we are hampered by unreliable estimates of the national income and its composition. But we are justified in using them, since we are more interested in their trends than in the absolute figures.

According to PAAUW[6], POLAK is considered to be the first who attempted to calculate the Indonesian national income figures for the period before the second world war. His efforts have been succeeded by NEUMARK and others after World War II. PAAUW himself made a comparative study of POLAK's and NEUMARK's national income figures and came to the following conclusions: "There had been a significant shift resulting in part from the structural change in the economy induced by the declining role of private foreign enterprises as well as by differential rates of economic

[6] D. S. PAAUW, The tax burden and economic development in Indonesia, *Ekonomi dan Keuangan 7*, 1954, pp. 566–569.

Table 3. National income by source, Indonesia, 1952.

	National income in 1000 US $	% from rural sector	Amount from rural sector
Agriculture			
peasant food crops	30,054	100	30,054
peasant export crops	7,650	100	7,650
estate crops	2,823	75	2,117
livestock	3,132	100	3,132
fisheries	2,688	100	2,688
forestry	1,246	100	1,246
total agriculture	47,592		46,886
export duties and statistical tax	1,507	37	558
net agriculture	46,085		46,328
Mining	1,846	33	609
Industry	6,700	50	3,350
Transport and communications	2,492	–	–
Trade, banking and insurance	10,943	varies	6,586
Hotels, restaurants and catering	224	–	–
Entertainment industries	168	–	–
Private building and construction	945	33	315
Rent	5,300	80	4,240
Free professions	500	–	–
Domestic service	550	50	275
Central government, including defence	4,055	67	2,703
Local government	1,250	67	833
Government, income from property, excl. estates	581	–	–
Net domestic product at factor cost	81,639	–	65,240

Source: *Ekonomi dan Keuangan 7*, 1954, p. 568.

Table 4. Value of agricultural exports of Indonesia, 1894–1940.

	Total exports in million guilders	Percentage of total from		Percentage of total from	
		Java and Madura	Outer Provinces	estates	peasants
1894	154	82	18	89	11
1913	419	65	35	76	24
1928	1,237	58	42	65	35
1933	306	50	50	59	41
1937	660	35	65	54	46
1938	426	43	57	60	40
1939	495	46	54	63	37
1940	593	40	60	63	37

Source: A. Pim, *Colonial agricultural production*, London, 1946, p. 24.

Table 5. Estimates of national income of Indonesia, 1958–1962, by source, at 1960 prices (in 1000 million rupiah).

	1958	1959	1960	1961	1962
Agriculture:					
farm foodcrops	124.3	127.9	132.0	129.6	140.1
farm non foodcrops	26.6	29.5	26.9	26.6	30.0
estate crops	12.9	12.6	11.7	11.7	10.5
animal husbandry	17.3	17.4	18.1	18.7	18.0
forestry + hunting	8.1	8.4	9.0	9.4	8.8
fishing	5.7	6.4	6.4	7.5	7.6
total agriculture etc.	194.9	202.2	204.1	203.5	215.0
Mining + quarrying	9.7	10.8	12.0	12.2	12.9
Manufacturing:					
large establishment + medium establishment	21.5	20.5	19.4	21.5	21.5
small establishment	29.8	28.3	28.7	31.3	30.0
Construction	6.8	7.1	7.1	7.2	7.5
Electricity + gas	0.8	0.9	0.9	1.0	1.0
Transport + communications:					
railroad transport	0.7	0.8	0.9	0.9	1.0
air transport	0.2	0.3	0.3	0.3	0.3
communication	0.3	0.4	0.4	0.4	0.4
other transport	10.3	10.9	11.6	11.9	12.2
Wholesale + retail trade	57.8	56.4	59.2	68.2	62.7
Banking + other financial intermediaries:					
banking	2.4	2.5	2.6	3.4	2.8
cooperative credit societies	0.1	0.1	0.1	0.1	0.1
others	0.3	0.3	0.6	0.6	0.4
Ownership of dwellings	7.2	7.3	7.4	7.6	7.9
Public administration + defence	25.6	20.7	16.1	17.8	8.9
Services:					
personal services	13.7	14.1	14.3	14.5	15.1
community services	7.1	7.4	7.4	7.6	7.8
recreational services	0.4	0.4	0.4	0.4	0.4
Net domestic product	389.6	391.4	393.7	410.4	407.9
Net investment income from abroad	3.1	3.5	3.0	3.9	4.5
Net national product	386.5	387.9	390.7	406.5	403.4

Source: Central Bureau of Statistics, preliminary data.

progress in the rural and non-rural sectors. In 1952, 81% of the total national income as computed by NEUMARK originated in the rural sector, while in 1939 the amount from this sector was 68%".

But the terms rural and non-rural are not identical to the terms agriculture and non-agriculture. Therefore an attempt has been made to calculate the contribution of agriculture.

A breakdown by industrial origin was computed by POLAK only for the ethnic group of Indonesians, since income arising from the other groups is based on income tax data.

He also estimated that the total value of agriculture, excluding the estates, amounted to DF 1,067 millions in 1939. Assuming that the total value of the exports is equal to that of the production of the estates and that there were no substantial changes in stocks of those products (which for 1939, the beginning of the World War II, was a reasonable assumption) we arrive at a total value of agricultural production in that year of DF 1,377 millions, or 46.9% of the national income, as calculated from Table 4. NEUMARK's calculations in 1952 resulted in agriculture contributed to 50.7% of the national income. POLAK's and NEUMARK's figures indicate that the share of agriculture increased from 46.9% in 1939 to 50.7% in 1952. This trend continued, as indicated by further national income studies made by the State Planning Bureau and the Central Bureau of Statistics for the years 1953 to 1962 (see Tables 5 and 6): in 1962 it was 53.5% (on basis of 1960 prices), and 58.4% (on current prices).

The place of agriculture in the economy is also shown by the number of professional workers in this field. The only reliable data available on the size of population, the

Table 6. Percentage distribution of national product by source 1958–1962, at 1960 prices.

	1958	1959	1960	1961	1962
Agriculture	50.4	52.1	52.3	50.1	53.3
Mining + quarrying	2.5	2.8	3.1	3.0	3.2
Manufacturing	13.3	12.6	12.3	13.0	12.8
Construction	1.8	1.8	1.8	1.8	1.9
Electricity + gas	0.2	0.2	0.2	0.2	0.2
Transport + communication	3.0	3.2	3.4	3.3	3.4
Wholesale + retail trade	14.9	14.5	15.2	16.8	15.5
Banking + other financial intermediaries	0.7	0.8	0.8	1.0	0.8
Ownership of dwellings	1.9	1.9	1.9	1.9	2.0
Public administration + defence	6.6	5.3	4.1	4.4	2.2
Services	5.5	5.7	5.7	5.5	5.8
Net domestic product	100.8	100.9	100.8	101.0	101.1
Net investment income	−0.8	−0.9	−0.8	−1.0	−1.1
Net national product	100.0	100.0	100.0	100.0	100.0

Source: CBS, see footnote Table 5.

Table 7. Number of professional workers in Indonesia, classified according to groups of activity (in thousands), 1930.

	Agriculture + mining	Industry	Transport	Commerce	Free professions	Public administration	Other professions	Total
Java and Madura:								
Indonesians	9,428.0	1,655.5	207.2	908.9	108.1	376.9	1,753.9	14,438.4
Europeans	11.8	3.9	9.4	9.4	8.9	16.6	6.8	66.7
Chinese	16.7	38.1	5.2	105.4	3.9	1.0	12.7	182.9
Other Asiatics	0.4	1.5	0.5	10.1	0.5	0.1	0.8	13.8
Total	9,456.8	1,698.9	222.3	1,033.9	121.3	394.6	1,774.1	14,701.9
Outer Provinces:								
Indonesians	4,765.2	449.6	83.5	181.9	42.2	115.0	203.7	5,841.2
Europeans	7.0	0.8	1.6	2.0	2.4	4.1	0.7	18.6
Chinese	128.2	55.9	7.6	66.5	3.3	2.0	23.4	287.1
Other Asiatics	6.6	3.6	1.2	9.0	0.4	0.4	1.2	22.3
Total	4,907.1	509.9	93.9	259.4	48.2	121.6	229.0	6,169.1
Total Indonesia:								
Indonesians	14,193.2	2,105.1	290.7	1,090.9	150.2	491.9	1,957.6	20,279.6
Europeans	18.8	4.7	11.4	11.4	11.3	20.7	7.4	85.3
Chinese	144.9	94.0	172.0	172.0	7.2	3.0	36.1	469.9
Other Asiatics	7.0	5.1	19.1	19.1	0.8	0.5	2.0	36.2
Total	14,364.0	2,208.9	316.2	1,293.3	169.5	516.2	2,003.2	20,871,0

Source: *Statistical pocketbook of Indonesia 1941*, p. 14.

Table 8. Number of employed persons (10 years and over) in various sectors in different regions, Indonesia, 1961 (in thousands, both sexes)

	Agriculture	Mining and quarrying	Manufacturing	Construction	Electricity, water, gas	Trade, banking, insurance	Transport, storage, communications	Services	Others and unknown	Total
Java and Madura:										
urban	245	4	559	185	20	630	305	1,098	52	3,098
rural	14,334	24	904	246	10	1,036	188	1,261	353	18,358
total	14,579	28	1,463	431	30	1,666	493	2,359	406	21,456
Sumatra:										
urban	105	17	61	35	12	140	64	152	8	594
rural	4,172	35	92	49	3	152	52	212	94	4,860
total	4,276	52	153	84	15	292	116	365	102	5,455
Borneo	1,314	3	52	19	1	81	27	105	36	1,639
Celebes	1,566	3	98	22	1	88	39	166	46	2,029
Other Islands	1,780	1	90	26	3	67	16	100	46	2,130
Total Indonesia:										
urban	502	21	684	254	36	880	418	1,422	81	4,298
rural	23,014	66	1,172	328	15	1,314	274	1,673	555	28,411
total	23,516	87	1,856	582	51	2,194	691	3,095	635	32,709

Source: *Statistical pocketbook of Indonesia 1963*, p. 272.

Table 9. Percentages of persons (10 years and over) employed in various sectors in different regions, Indonesia, 1961.

Region	Agriculture	Mining and quarrying	Manufacturing	Construction	Electricity, water, gas	Trade, banking, insurance	Transport, storage, communication	Services	Others and unknown	Total
Djakarta	4.9	0.2	16.1	8.7	0.5	24.2	12.0	32.1	1.3	100.0
West-Java:										
urban	10.0	0.1	17.3	4.6	0.7	20.0	10.6	35.6	1.1	100.0

rural	74.6	0.2	5.9	2.1	0.0	6.5	1.4	7.6	1.7	100.0
total	68.0	0.2	7.1	2.4	0.1	7.9	2.3	10.4	1.6	100.0
Central Java:										
urban	9.8	0.1	21.3	6.4	1.1	16.4	7.1	35.8	2.0	100.0
rural	76.4	0.1	5.9	1.2	0.0	5.9	1.1	7.8	1.6	100.0
total	69.9	0.1	7.4	1.7	0.1	6.9	1.7	10.5	1.7	100.0
Jogjakarta	69.3	0.0	11.2	1.1	0.1	6.5	1.2	8.1	2.5	100.0
East Java:										
urban	8.3	0.2	16.9	4.3	0.6	19.4	9.3	38.7	2.3	100.0
rural	81.8	0.1	3.2	0.9	0.1	5.0	0.8	5.9	2.2	100.0
total	73.4	0.2	4.7	1.3	0.1	6.6	1.8	9.7	2.2	100.0
Total Java and Madura:										
urban	7.9	0.1	18.0	6.0	0.7	20.3	9.8	35.5	1.7	100.0
rural	78.1	0.1	4.9	1.3	0.1	5.7	1.0	6.9	1.9	100.0
total	68.0	0.1	6.8	2.0	0.1	7.8	2.3	11.0	1.9	100.0
Sumatra										
urban	17.6	2.8	10.4	5.8	2.0	23.6	10.8	25.7	1.3	100.0
rural	85.8	0.7	1.9	1.0	0.1	3.1	1.1	4.4	1.9	100.0
total	78.4	1.0	2.8	1.5	0.3	5.4	2.1	6.7	1.8	100.0
Borneo	80.2	0.2	3.2	1.2	0.1	4.9	1.7	6.4	2.1	100.0
Celebes	77.2	0.2	4.8	1.1	0.1	4.3	1.9	8.1	2.3	100.0
Other Islands	83.6	0.1	4.2	1.2	0.1	3.2	0.8	4.7	2.1	100.0
Indonesia:										
urban	11.7	0.5	15.9	5.9	0.8	20.5	9.7	33.1	1.9	100.0
rural	81.0	0.2	4.1	1.1	0.1	4.6	1.0	5.9	2.0	100.0
total	71.9	0.3	5.7	1.8	0.1	6.7	2.1	9.5	1.9	100.0

Source: *Statistical pocketbook of Indonesia 1963*, p. 273.

Table 10. Export by economic groups[1], Indonesia, 1938–1940 and 1958–1962 (million rupiahs).

	Total agricultural products	Mineral products	Other products	Total
1938	473.0	206.3	7.8	687.1
1939	538.8	226.3	8.6	773.7
1940	656.7	274.0	8.2	938.9
1958	4,937.7	4,058.9	22.0	9,013.6
1959	6,841.0	3,716.1	55.7	10,612.8
1960	25,171.2	12,511.5	152.5	37,835.2
1961	21,792.9	13,584.8	89.8	35,467.5
1962	19,204.5	11,433.0	67.9	30,675.4

[1] Excluding gold and silver.

Source: *Statistical pocketbook of Indonesia 1963*, p. 133.

Table 11. Agricultural export as a percentage of total exports for Indonesia, 1938–1940 and 1958–1962.

1938	1939	1940	1958	1959	1960	1961	1962
68.9	69.6	70.0	54.8	64.5	66.5	61.5	62.6

Source: *Statistical pocketbook of Indonesia 1963*, p. 133.

rate of growth, its composition by age and its other characteristics are from the Population Censuses of 1930 and 1961.

The 1930 Census figures indicate that 68.9% of the population found their living in the production of raw materials originating from agriculture and mining as can be seen in Table 7. Assuming that the workers in mining constitute about 0.3% of the labour force, then in 1930 we could derive from the two figures above that about 68.6% of Indonesia's population made their living in agriculture. This figure is supported by GEERTZ[7]. The 1961 census figures indicated that 71.9% of the Indonesian population is engaged in agriculture as illustrated by Tables 8 and 9.

The general conclusion is, that there are more people engaged in agriculture now than before World War II.

In the export business, agricultural products still play a very important part in earning foreign exchange, as can be seen from the figures in Tables 10 and 11. They indicate that before the war about 69% of the exports were contributed by agriculture and that this percentage has declined to 62–64% after the war[8]. Moreover, there have been changes within the composition of the agricultural sector not shown in this table. A more detailed analysis will be given later in this study.

[7] C. GEERTZ, *Agricultural involution. The process of ecological change in Indonesia*, Berkeley and Los Angeles, 1963, p. 131.

[8] It is difficult to be more specific about the postwar period because of large annual fluctuations.

Summarizing it can be stated that the backbone of Indonesian economy was and still is agriculture, and that its importance has rather increased than decreased after the war. And as regards to export earnings, although they have slightly decreased in importance, they still are considerable.

Therefore it is obvious, that a substantial part of the resources for economic development in Indonesia have to be derived from agriculture, and that economic development can be accelerated by using the agricultural resources as fully and as effectively as possible. To see how this has been accomplished will be discussed in the following chapters.

3 Short historical survey of the agricultural development in Indonesia

Agriculture in Indonesia is traditionally discussed in terms of a division between 'estate agriculture' and 'peasant agriculture'. This traditional division is followed in our survey of agricultural development, which is divided into two periods, namely before and after World War II.

3.1 The period before World War II

3.1.1 Estate agriculture

The most interesting issue in Indonesian agricultural development is the contribution by estates.

During the British interim administration of the Netherlands East Indies from 1811 to 1816, a plantation system was introduced by RAFFLES. Among other things he gave extensive land concessions to private enterprises to develop estates employing indigeneous labour.[9]

After the return of the East Indies to the Netherlands Government there was a transitional period in governmental policy, which was characterized by the struggle between continuing RAFFLES' policy, in which participation of private enterprises was to be encouraged, or to that of the Netherlands East Indies Company, which desired the re-introduction of compulsary labour and forced delivery in the scope of a state monopoly.[10] In 1830 the Netherlands' government finally decided in favour of what ultimately became the 'Cultuurstelsel' advocated by VAN DEN BOSCH. The basis of this system was that the Javanese should cultivate one fifth of the village's arable land with export crops designated by the government, or work 66 days a year in

[9] H. J. BOEKE, Objective and personal elements in colonial welfare policy, in: W. F. WERTHEIM, *Ed.*, *Indonesian economics. The concept of dualism in theory and policy*, The Hague, 1961, pp. 281–282 and 288. Also cited by A. PIM, *Colonial agricultural production. The contribution made by native peasants and by foreign enterprise*, Oxford, 1946, p. 15. See also: G. GONGGRIJP, *Schets ener economische geschiedenis van Nederlandsch-Indië*, 1949, pp. 71–78 and C. ROBEQUAIN, *Malaya, Indonesia, Borneo and the Philippines: A geographic, economical and political description of Malaya, the East Indies and the Philippines*, London, 1954, p. 314.

[10] BOEKE, *op. cit.* (*fn.* 9), pp. 281–288; PIM, *op. cit.* (*fn.* 9), pp. 15–18; GONGGRIJP, *op. cit.* (*fn.* 9), pp. 79–139; ROBEQUAIN, *op. cit.* (*fn.* 9), pp. 314–319.

[11] BOEKE, *op. cit.* (*fn.* 9), pp. 294–299; PIM, *op. cit.* (*fn.* 9), pp. 18–20; GONGGRIJP, *op. cit.* (*fn.* 9), pp. 139–170; ROBEQUAIN, *op. cit.* (*fn.* 9), pp. 319–327.

government owned estates or enterprises. In return they would get a small payment and refund of land taxes. This forced delivery of crops resulted in restrictions on private enterprises.[11] In 1870 the Dutch abandoned this state monopoly over Indonesia's agrarian resources and opened up the possibility for private entrepreneurs to acquire land for growing commercial crops on a large scale. This land could be obtained either by renting cultivated lands from the local population or, on a longterm lease, uncultivated 'waste land' from the government.[12]

The law prohibited the sale of peasants' land (except of small urban lots) to others than native Indonesians. Simultaneously a bill was introduced by Minister DE WAAL for the gradual abolition of the 'Cultuurstelsel'.

The opening up of Indonesia to individual commercial enterprises attracted a great number of 'planters'.[13] The development of their estates and their distribution by size under the various landrights from 1875–1937 is illustrated by Table 12. Their total area increased from 304,000 ha in 1875 to 2,435,000 ha in 1937.[14] At first, the estates were concentrated in Java. By the discovery of Deli (East-coast of Sumatra) as tobacco land this type of agriculture spread to Sumatra and then to the other islands. Since the beginning of the twentieth century, the area occupied by estates in the Outer Islands even outstripped that of Java.[15] Most of them were established on long-term contracts. Their total area reached its maximum in 1927; at that time approximately 3.4 million ha were under estates; of which about one million ha in Java and 2.4 million in the 'Outer Islands'.[16]

The distribution of these estates and their planted areas are given in Table 13. It shows that the estates were concentrated in Java and Sumatra. Their average size in Sumatra was nearly 2.2 times that in Java, but the average percentage area under cultivation was lower. This can be explained by the need for more land for the cultivation of the Deli tobacco, which can only be grown on the east coast of Sumatra. To get the specific quality of this famous tabacco a land rotation of eight years is needed.

All estates worked with hired labour. In the over-populated Java this presented no problem. But the increase of available labour in the rural sector and in the cities kept wages and working conditions low. This induced the migration of Javanese landless farmers and farm labourers to the Outer Provinces, especially to the eastcoast of Sumatra, where they could get higher wages. Because this area is sparsely populated, many of the estates depended almost entirely on such imported labour, either from Java or, as was frequently the case before the war, from south China. Therefore, the estates in Sumatra concentrated on special crops which require a low labour-land ratio and they cultivated a smaller range of commodities, mostly specializing in one product.[17]

[12] See footnote 11.
[13] See footnote 11.
[14] A. JONKERS, *Welvaartszorg in Indonesië; een geschiedenis en perspectief*, The Hague 1948, p. 68.
[15] *Ibid.*
[16] In the Outer Islands, the major estate area remained the Eastcoast of Sumatra.
[17] PIM, *op. cit.* (*fn.* 9), p. 25.

The amount of capital invested in the estates is difficult to estimate, but it is thought to have been considerable. Around the year 1900, total private investments in the Netherlands East Indies were calculated at 750 million guilders, in 1915 at 1,500 million,[18] in 1929–1930 at 4,000 million for the total capital invested in big enterprises[19] and in 1939 they amounted to 4,800 million guilders.[20] How much this went to the estates is not known, but the preponderance of agricultural undertaking has been obvious.[21] Roughly calculated, more than 75% of all private investments in 1939 were of Dutch origin.[22]

Tobacco, sugar, rubber, coffee, tea, palmoil and cinchona were the principal estate crops. Their success can be gauged by the exports as indicated by Table 4 under 2.

Up to 1930 the export of agricultural products expanded considerably. Then followed a severe decline, due to the world-wide economic depression. Thereafter, exports partially recovered, a recovery interrupted by the outbreak of World War II. Some of the expansion could be accounted for by the increase in the number of smallholders producing export crops, but by far the major portion was the result of estate activity. In 1939, the estates still produced 63% of the total agricultural exports. But their share was declining, as was also shown in Table 4.

The success of the estates was mainly due to the progress of scientific methods applied in agriculture. The Dutch scientists in this field had become famous for the improvements they made in tropical agriculture. The private experiment stations of the estate corporations in Bogor (primarily for rubber, tea, and cinchona), Pasuruan (for sugarcane), Djember (for coffee), Klaten (for tobacco), Medan (for tobacco, rubber, and palmoil) enjoyed special fame throughout the world. Amongst their successes most spectacular were the revolutionary increases in yield of sugarcane[23] and the improvement in rubber production per acre.[24]

3.1.2 Peasant agriculture

It is not possible to give an accurate picture of the development of peasants' agriculture for the whole of Indonesia as prewar data for food production are available for Java and Madura and not for most of the 'Outer Provinces'. However, Table 14 indicates a very rapid expansion of peasants' export crop production: its share in

[18] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 323. He mentions 750,000 florins, which the author thinks must be a printing error.

[19] Big enterprises employ 50 or more workers. See: J. M. VAN DER KROEF, *Economic origins of Indonesian nationalism*, in: P. TALBOT, *South Asia in the world today*, Chicago, 1950, p. 177.

[20] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 323. By GONGGRIJP, *op. cit.* (*fn.* 9), p. 205, estimated at 4000 million.

[21] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 323.

[22] VAN DER KROEF, *op. cit.* (*fn.* 19), p. 177. See also GONGGRIJP, *op. cit.* (*fn.* 9), p. 205.

[23] The most famous sugar strain was POJ 2878.

[24] Rubber production per acre increased from 450 lb. to 4400 lb. Although the 4400 lb. per acre is only reached at the experimental fields the achievement is striking. See ROBEQUAIN, *op. cit.* (*fn.* 9), p. 344.

total export of agricultural products increased from 10.9% in 1894 to 37.4% in 1939.[25]

In the sparsely populated regions outside Java, the peasant can use large areas for new crops without encroaching on the space needed for his own subsistence. He has only to make use of the 'ladangs' (shifting cultivation plots) to raise food crops as well as cash crops. The best example is rubber. If rubber prices are high, the peasant may neglect his food crops and concentrate on the rubber; when the price of this product declines, he may fall back on his food crops and abandon his commercial crops. Thus he is secured from the type of economic crisis that develops on estates.[26] The flexibility of peasants' rubber production, its low costs and the expanding world demand, have resulted in a rapid increase in output. The area under smallholders' rubber has been estimated at 1,200,000 ha.[27] More details will be covered in 3.2.2.

It is difficult to estimate the area cultivated by other export products as ladangs are scattered about. It is also not known how much of this land was devoted to food crops as this proportion fluctuated from year to year.

There have also been some efforts by the government to increase food production in the Outer Provinces. In 1910 it started the construction of irrigation works. Between 1910 and 1938 a total of 17 million guilders was spent in these efforts. In the years before the war expenditures were greatly increased, especially for the migration of Javanese farmers to other islands. Important projects were started in the residencies of Palembang and Lampung of southern Sumatra as well as in Celebes.

The inadequacy of statistical information of peasants' agriculture of the Outer Provinces before World War II necessitated concentrating primarily on the developments in Java, which will be treated in Chapter 4.

3.2 The period after World War II

3.2.1 Estate agriculture

The postwar period, up till 1965, was characterized by a declining output of estate crops[28], as can be seen in Table 15. This drop is due to the decreasing 'mature' area of the planted acreage (see Table 16). Another important factor is the falling yield per hectare. For example, sugar output per hectare dropped from 162 quintal in 1938 to 80 quintal in 1963. But postwar production of rubber was not substantially lower than that before World War II, because immediately after the war, the areas planted with highly valuable new varieties had matured.[29]

For 1966 the goverment's targets for the main estate crops' production are set

[25] These figures also show the increasing importance of the Outer Provincies both in plantation and peasant production for export and their more rapid recovery from the depression of the early thirties.
[26] Pim, *op. cit.* (*fn.* 9), p. 35.
[27] US Government, *Perspectives and proposals for US economic aid*, p. 68.
[28] Central Bureau of Statistics, *Statistical pocketbook of Indonesia 1963*, pp. 83–84.
[29] *Ibid.*

higher than that of the previous years (Table 15). But it is not known whether those targets were really reached.

The number of all estates and of the total acreage of planted areas also diminished, as is shown in Tables 17–19. In 1961 there were 1,125 estates with a total planted area of 852,000 ha, as against 2,395 estates with 1,171,000 ha in 1938. The quantity of estate products strongly declined between 1940 and 1962 (see Table 20); its value declined from 43% of the total export in 1940 to 25% in 1962 (see Table 21).[30]

Table 12. Area occupied by estates under various landrights in Java and the Outer Provinces, 1875–1937, in 1000 ha.

	1875	1890	1905	1920	1927	1935	1937
Java:[1]							
long-term lease from princes in the 'Vorstenlanden'	230.0	249.4	234.1	224.5	75.0	51.6	60.4
short lease from local farmers	10.0	75.2	120.0	208.8	226.8	52.0	93.9
long-term lease from State domain	23.6	264.0	544.0	660.5	662.6	609.4	595.8
government estates	0.6	1.0	1.8	14.9	15.8	18.0	20.5
total	264.2	589.6	899.9	1108.7	980.2	731.0	770.6
Outer Provinces:							
agricultural concessions	39.7	343.0	546.8	1146.5	1344.0	1124.6	1063.6
long-term lease from State domain	0.5	52.3	223.9	877.1	1106.7	720.7	600.8
total	40.2	395.3	770.7	2023.6	2450.7	1845.3	1664.4
Total	304.4	984.9	1670.6	3132.3	3430.9	2576.3	2435.0

[1] Excluding the so-called 'particuliere landerijen' (large private estates).

Source: see footnote 14.

Table 13. Number of estates and planted areas in Indonesia (1938).

	Number of estates	Total area in ha	Average size in ha	Total area planted in ha	Average size of planted area per estate in ha	Average percentage planted of total area
Java	1,187	1,079,202[1]	909	597,865	504	55.4
Sumatra	607	1,249,850	2,509	515,887	850	41.3
Borneo	200	61.794	309	17,813	89	28.8
Celebes	220	42,991	195	21,796	99	50.7
Moluccas	149	36,742	245	14,441	97	39.5
Lesser Sunda Isls.	39	14,795	379	3,119	80	21.1
Indonesia	2,402	2,485,104	1,035	1,170,891	487	47.1

[1] Including the so-called 'particuliere landerijen' (large private estates).

Source: C. J. J. VAN HAL and C. VAN DE KOPPEL. *De landbouw in den Indischen Archipel*, Vol. 1 (1946) 392.

[30] See *Bull. Indon. Econ. Studies 5*, 1966 and *6*, 1967.

Table 14. Percentage of estates' and smallholders' production in the total agricultural export of Indonesia, 1894–1939.

	Java and Madura		Outer Provinces		Indonesia	
	estate	small-holders	estate	small-holders	estate	small-holders
1894	94.3	5.7	67.7	32.3	89.1	10.9
1902	90.4	9.6	48.7	51.3	79.7	20.3
1906	90.2	9.8	43.5	56.5	79.7	20.3
1910	84.2	15.8	30.0	70.0	72.7	27.3
1917	91.6	8.4	62.4	37.6	83.1	16.9
1921	88.8	11.2	56.4	43.6	79.4	20.6
1925	86.1	13.9	40.6	59.4	63.3	36.7
1927	88.2	11.8	46.8	53.2	68.7	31.3
1929	82.3	17.7	41.0	59.0	63.5	36.5
1932	77.1	22.9	48.0	52.0	64.2	35.8
1934	79.9	20.1	51.2	48.8	64.7	35.3
1936	73.2	26.8	56.0	44.0	63.3	36.7
1937	75.4	24.6	42.8	57.2	54.2	45.8
1938	76.9	23.1	48.0	52.0	60.3	39.7
1939	82.4	17.6	45.5	54.5	62.6	37.4

Source: see footnote 14.

Table 15. Production of main estate crops in Indonesia, in 1000 metric tons, 1938–1940, 1958–1966.

	1938	1939	1940	1958	1959	1960	1961	1962	1963	1964	1965	1966[1]
Cane sugar[2]	1400	1576	1607	771	855	672	651	585	650	649	790	825
Hevea rubber	175	198	283	243	224	219	229	217	216	213	213	211
Coffee	46	58	39	13	19	18	19	12	18	7	14	21
Tea	68	71	69	49	44	46	43	47	39	46	48	48
Oilpalm products	275	297	260	183	171	174	180	174	181	195	189	220
Tobacco	35	35	21	6	7	7	8	8	10	7	–	–
Hard fibres	33	36	39	28	23	20	17	9	4	4	5	–
Cinchona bark	11	12	16	4	4	4	3	2	2	–	–	–
Cocoa	2	2	2	1	1	1	1	1	1	–	–	–

[1] Targets. [2] Including peasant cane processed by the factories.

Source: *Statistical pocketbook of Indonesia 1963*, p. 84 for the years till 1960; further data supplied by Indonesian authorities.

Table 17. Total and planted area[1] of estates in exploitation, Indonesia, 1938–1940 and 1957–1961 (× 1000 ha).

	1938	1939	1940	1957	1958	1959	1960	1961[2]
Total area	2485.1	2495.8	2491.4	1818.9	1803.3	1700.4	1704.3	1723.8
Planted area	1170.9	1206.1	1197.7	841.8	826.9	828.7	841.8	851.6
Hired from principalities	45.2	48.1	42.5	3.7	4.1	4.1	4.0	–

[1] Including 'hired from principalities'.
[2] For the year 1961 in accordance with the Agrarian law no. 5, 1960.

Source: *Statistical pocketbook of Indonesia 1963*, pp. 80–81.

Table 16. Planted areas of principal estate crops in Indonesia, in 1000 ha (1938–1940 and 1958–1963).

	Hevea rubber		Tea		Coffee		Oil palm		Cinchona		Sugarcane	Tobacco
	total	mature	total	mature	total	mature	total	mature	total	mature		
1938	595.8	529.4	138.3	137.0	103.6	96.1	92.3	74.5	17.0	15.0	85.7	42.0
1939	615.6	521.0	138.4	136.9	99.2	91.5	105.1	76.0	17.0	14.8	95.5	36.5
1940	626.4	514.4	138.3	136.4	96.1	87.5	109.6	78.1	16.8	14.2	91.7	18.9
1958	498.2	435.5	74.3	65.9	47.1	41.7	104.5	92.4	7.2	6.3	52.1	7.6
1959	498.8	427.7	72.9	66.1	47.2	42.3	102.9	86.8	6.5	5.5	55.5	12.4
1960	505.8	425.4	72.9	66.7	47.1	42.1	104.3	88.0	5.4	4.5	56.6	13.1
1961	512.6	426.7	72.4	66.2	46.6	41.3	104.9	88.2	4.4	3.4	60.0	12.5
1962	516.3	423.0	77.8	65.7	44.1	39.0	104.7	89.5	3.9	3.0	74.6	–
1963	520.8	414.5	79.0	66.7	42.6	37.4	106.0	90.4	3.5	2.9	80.1	–

Notes: All areas include interplanted crops.
Mature area: Hevea rubber = tappable area.
Tea = picked gardens and pruned area.
Cinchona = area older than normal rotation age.

Sources: *Statistical pocketbook of Indonesia 1963*: for the years up till 1963. For 1963 see: *Planted area, production and stocks of principal estate crops 1963*, pp. 52–57, except for sugarcane, which is has been taken from *Hasil sensus perkebunan 1963*, table 4.

Table 18. Total and planted area of estates in exploitation in different regions, 1961 (× 1000 ha).

	Total area	Planted area
Java and Madura	626.7	385.5
Sumatra	1030.3	438.8
Borneo	35.6	10.9
Celebes	11.9	8.3
Moluccas and West Irian	8.9	5.7
Lesser Sunda Islands	10.9	2.4

Source: *Statistical pocketbook of Indonesia 1963*, pp. 80–81.

Table 19. Number of estates in exploitation in Indonesia, by crops, 1938–1940 and 1958–1962.

	1938	1939	1940	1958	1959	1960	1961	1962
Sugarcane	97	102	100	54	54	53	54	54
Hevea rubber	1202	1119	1221	746	742	746	730	732
Coffee	401	377	369	174	175	172	158	153
Tea	337	337	338	168	161	161	142	148
Cinchona	107	110	108	51	51	44	34	32
Coca	38	37	39	49	44	41	30	29
Oilpalm	60	66	64	49	50	49	47	46
Fibre crops	(44)	(36)	(33)	8	7	9	7	6
Tobacco	87	88	78	39	40	41	36	–
Ficus rubber	70	68	69	4	4	2	0	–
Gutta percha	3	3	3	1	1	1	1	–
Coconutpalm	665	680	684	111	114	122	112	–
Kapok	211	206	208	46	48	51	42	–
Pepper	43	38	39	8	8	9	7	–
Cocoa	52	50	50	13	13	11	11	–
Nutmeg	34	32	35	13	12	12	7	–
Essential oils	103	88	93	4	5	3	2	–
Cassava	(28)	(35)	(40)	2	2	3	3	–
Total	2402	2401	2395	1541	1135	1146	1125	

Notes: estates with more than one crop are counted only once in the Total; numbers between brackets are incomplete data.

Source: *Statistical pocketbook of Indonesia 1963*, p. 82.

Table 20. Export from Indonesia by main economic groups in million kgs, 1938–1940 and 1958–1962.

	Estate products	Farm products	Mineral products
1938	2,157.3	1,290.0	6,901.8
1939	2,668.6	1,287.0	7.468.3
1940	1,924.0	1,021.0	7,690.8
1958	661.5	778.3	15,284.5
1959	645.2	1,058.0	12,779.0
1960	589.7	953.4	14.291.8
1961	595.4	1,153.7	15,964.5
1962	565.0	881.1	12,526.6

Source: *Statistical pocketbook of Indonesia 1963*, p. 133.

Table 21. Export by main economic groups of products in million rupiahs, Indonesia, 1938–1940 and 1958–1962.

	Live animals and animal products	Vegetable products						Mineral products	Other products	Grand total
		estate products	farm products	minor forest products	wood	other	total			
1938	8.1	284.7	164.2	9.8	4.1	2.1	464.9	206.3	7.8	687.1
1939	8.6	333.6	179.6	11.4	3.5	2.1	530.2	226.3	8.6	773.7
1940	8.3	401.6	229.0	13.3	2.5	2.0	648.4	274.0	8.2	938.9
1958	40.0	2,207.3	2,579.8	87.0	17.8	5.8	4,897.7	4,058.9	22.0	9,013.6
1959	53.9	2,443.4	4,200.9	121.7	15.8	5.3	6,787.1	3,716.1	55.7	10,612.8
1960	161.7	9,549.1	15,082.0	276.3	85.0	17.1	25,009.5	12,511.5	152.5	37,835.2
1961	189.8	8,771.1	12,512.8	236.2	64.3	18.7	21,603.1	13,584.8	89.8	35,467.5
1962	195.8	7,336.7	11,302.0	275.6	46.4	48.0	19,008.7	11,433.0	67.9	30,675.4

Source: *Statistical pocketbook of Indonesia 1963*, p. 133.

Reconstruction is proceeding slowly and with difficulty. As has been said before, estates' export earnings failed to expand or even to maintain their output after the war. This failure can be attributed to a number of factors.

From the outbreak of World War II until 1957, the position of the foreign-owned enterprises was increasingly uncertain and the re-investment program sharply diminished. Another problem was that during the Japanese occupation, from 1942-1945, large areas of estate lands were given to the peasants. Especially on the east-coast of Sumatra, which was a rice-importing region before the war, the Japanese encouraged the local population to grow food. Another factor was the Indonesian government's reluctance to remove squatters from the state plantations. Furthermore it did not undertake vigourously the rehabilitation program for rubber and other estate crop, after taking over the foreign estates. Difficulties in developing adequate management and administration were another important factor. When most of the Dutch experts departed in 1958, less experienced Indonesians had to carry on, whereas labour troubles and rising costs impaired the reconstruction of the estates.

The export figures of estate crops might have been considerably higher if the foreign exchange earnings had included losses due to smuggling and underinvoicing. The falling rupiah earnings in the legitimate export trade and the burden of uncertainty from chronic inflation resulted in loss of confidence in the rupiah which, in turn, led to an increase in these disagreeable practices. This situation will continue so long as there is no basic financial reform to check inflation.

The crops found primarily in estates of the 1960's (oilpalm products, cinchona, cocoa, hard fibre, tea and sugar) were also primarily estate crops during the 1930's. With regard to the present estate crops, the most important change in recent years has been the sharp decline in export of centrifugal sugar, which reflects curtailed planting and destruction of factories during the Japanese occupation and thereafter.[31] The problem of sugar will be dealt with in Chapters 4 and 8.

3.2.2 Peasant agriculture

On peasants' non-food crops only figures for the period after 1957 are available. Before the war the area under peasants' rubber was estimated at 1,200,000 ha; it has increased to 1,300, 000 ha at the present time.

For the crops other than rubber, the total harvested area increased from 2,400,000 ha in 1957 to 2,501,000 ha in 1961, an increase of 4%. The greater part of these farm lands is cultivated with coconut: in 1961 about 1,666,000 ha (see Tables 22 and 23).

The development of the production of peasants' non-food crops can be seen in Table 24: rubber and tea production show a continuous increase, while the production of other crops fluctuates from year to year.

[31] V. D. WICKIZER, The smallholder in tropical export crop production, *Food Research Institute Studies I* (1960), p. 92.

The main peasant export crops are rubber and copra, while sugar, tobacco, tea, cassava, pepper and kapok are relatively minor export products. Since the crops other than rubber, copra and pepper are primarily Javanese crops, they will be dealt with in Chapter 4, in the Javanese situation. The development of rubber, copra and pepper are as follows.

Rubber. After 1950, peasants' production has expanded relatively more than before World War II, because government policy generally favoured the smallholder above further development of the estate agricultural system.

The development of smallholders' rubber export after the war is shown by Table 25. The main production areas of peasants' rubber are West Borneo, South and East Borneo, Palembang, East Sumatra, Djambi, Tapanuli and Lampung. Their relative importance can be seen in Table 26.

The rapid expansion of peasant rubber was possible because a large part of the peasant acreage was tapped practically without recourse to outside labour. Such is the case in Palembang and West Borneo. But even where tapping is done by hired labour, as in the case of Djambi, it is generally carried out on some kind of share basis, involving hardly any cash expenditure. Only the purchase of coagulants, the hire of a mangle and local transport to the market involve small cash costs. The owner of the larger smallholdings frequently has to rely on outside labour, but because it is only used for tapping (again often on a share basis), his cultivation and overhead costs remain small.

This low cost and, as indicated earlier, the flexibility to return to growing his own food when rubber prices are low, are the main reasons why peasant rubber is more suited to respond to the fluctuating world demand of natural rubber in the postwar period. However, this low production cost is partly counterbalanced by the relatively low yield. Between 1952–1959, dry rubber output of peasants varied between 320 and 395 kg per ha as against 538 to 755 kg per ha for estates. In addition, smallholders' rubber is generally of a lower quality.[32]

The export figures show the growing importance of the peasant rubber and the lead over estate production. The peasants' proportion increased from 40% in 1920 to 49% in 1939. In 1949, it had increased to 60%, to 63% in 1957 and to 70% in 1962. The year 1965, however, showed a decline to 60%.[33] Although the export of peasants' rubber had developed rapidly after World War II, there are strong indications that its future position as the main foreign exchange earner will be threatened. This is based on the high proportion of overaged trees. Though exact data on the age distribution

[32] See footnote 27, p. 69.

[33] WICKIZER, *op. cit.* (*fn.* 31). For the figures till 1957 and for 1962: *Statistik konjunktur 1963*, p. 47. Rubber production and exports are of major importance to the Indonesian economy. In the period 1950–1958 rubber has contributed between 30 to 50% of the total value of its exports as can be seen from Tables 27 and 28. Exports of estate products including rubber averages 65% as compared with 1938, excluding rubber only 41%. More striking is the case of peasant crops; included rubber it is, compared with 1938, 182%, and only 57% if rubber is excluded.

of peasant rubber trees are not available, a study based on an intensive field survey estimated that from 50 to 60 percent of smallholders' planting are no longer productive or produce so little as to be uneconomic except when rubber prices are high.[34] The replanted acreage with high yielding trees has not been satisfactory to offset the declining production per hectare. Between 1959–1961 probably no more than 3% of the 1959 stock of smallholders' acreage was replanted; thus replanting is not sufficient.[35] This means that in rubber Indonesia has been living of prewar capital and is now in a vulnerable position. On the one hand it must do much planting to restore its capital, but, on the other hand, supplementation in sufficient quantities involves a further loss of export earnings for several years in the future.

In addition, Malaysia, Indonesia's main competitor in natural rubber export, is successfully developing and planting new high yielding trees, which produce two to four times as much rubber per hectare.[36] And at the same time synthetic rubber threatens to become an almost full substitute for natural rubber, and competition between natural and synthetic intensifies.

Copra. The development of copra, another main peasants' export product in Indonesia, shows an other picture. Area and production have been more or less stable since 1957 as can be seen from Tables 22 and 23. But exports in 1962 dropped considerably compared with the prewar figures (Table 29). This is primarily caused by an increase in domestic consumption: Java, before the war an exporter of this product, has now to import it from the Outer Islands.

As illustrated in the figures from 1953 to 1961, copra purchased in eastern Indonesia, which up to 1958 was the main region and source of copra purchased by the Induk Koperasi Kopra Indonesia (IKKI, the Central Copra Cooperative) for export and domestic consumption, turned out to decline in 1958 and 1959. However, Borneo and other regions were growing in importance during those years (see Table 30).

The decline, experienced by Eastern Indonesia throughout 1958, was caused by the revolt of the Permesta[37] in Northern Celebes and also by transportation difficulties. In 1960–1961, after the Permesta uprising was more or less suppressed, there was again an increase in the export of copra from this region. In 1962 it dropped again, caused by more intensive smuggling (see Table 29).

Due to all these difficulties, the short-run prospects of exports of smallholders' copra are declining; the long-term outlook is even bleaker, owing to overaging trees and insufficient replanting. Thus Indonesia is not replacing its prewar investments in copra too.

Pepper. Before the war, Indonesia was the leading supplier of the world pepper market. Table 31 shows the decrease of the export in the postwar period.

[34] US GOVERNMENT, *op. cit.* (*fn.* 27), p. 70.
[35] *Ibid.*, p. 71.
[36] *Ibid.*, p. 67.
[37] 'Permesta' is a primarily religious group that came in revolt to the Central Government.

Table 22. Planted area of principal commercial farm crops, excl. rubber, Ind., 1957–1961 (× 1,000 ha).[1]

	1957	1958	1959	1960	1961
Coconuts	1597.1	1651.2	1561.3	1649.3	1665.9
Coffee	192.4	198.9	208.9	230.8	240.2
Tea	60.1	60.1	62.9	64.3	64.4
Kapok	212.4	220.1	172.9	138.5	146.1
Arecanuts	54.9	55.5	53.6	59.4	60.0
Pepper	27.5	33.4	34.3	33.7	34.7
Cloves	29.2	29.3	35.3	36.6	43.2
Nutmeg	9.5	9.0	9.8	10.4	12.0
Sugarcane[2]	38.0	43.3	43.3	35.8	34.6
Tobacco[2]	180.7	178.3	132.5	129.0	196.1
Total	2401.8	2479.1	2314.8	2387.8	2497.2

[1] Total planted area refers to the area at the end of the year.
[2] Harvested area.

Source: *Statistical pocketbook of Indonesia 1963*, pp. 74–77.

Table 23. Production of principal commercial farm crops, exclusive rubber, Indonesia (1000 tons of dry product) (1957–1961)

	1957	1958	1959	1960	1961
Coconuts	1092.8	1077.8	1169.4	1239[1]	1361[1]
Coffee	60.0	54.1	65.3	77.6	89[1]
Green tea	22.3	23.7	32.1	37.4	37.7
Kapok	29.0	28.8	25.8	20.8	20.2
Arecanuts	40.5	12.0	41.2	45.0	46.6
Pepper	22.0	16.8	14.1	12.2	13.7
Clovers	5.1	3.8	4.7	6.0	7.1
Nutmeg	7.4	4.1	4.0	5.2	5.8
Brown sugar	263.8	285.6	283.2	255.4	305[1]
Tobacco	68.5	61.0	49.1	69[1]	75.9

[1] Corrected data, supplied by the Ministry of Finance.

Source: *Statistical pocketbook of Indonesia 1963*, pp. 74–77.

The fall in pepper exports is primarily caused by smaller production. The rehabilitation of white pepper, which is grown in Bangka, has not been satisfactory. Only a small percentage of the prewar area has been put back into production.[38] Neither is the development of black pepper, which is grown in the Lampung area, very encouraging. Production has fallen through neglect, and exports have decreased because of transportation difficulties and high costs of marketing.[39]

[38] Before World War II, white pepper was chiefly grown by Chinese farmers. During the war the fields were damaged and they were not fully restored thereafter, as many Chinese left the island.
[39] Based on the author's observations in the pepper area after World War II.

Table 24. Main peasants' non-food production in Indonesia in 1000 metric tons, 1960–1966.

	1960	1961	1962	1963	1964	1965	1966[1]
Rubber	403	476	496	490	510	510	536
Copra	1239	1361	1387	1379	1193	1249	1350
Sugarcane	255	305	184	176	438	414	433
Tea	37	37	37	39	41	42	42
Coffee	78	89	99	127	80	91	107
Tobacco	69	76	72	81	52	72	111

[1] Targets.

Source: Data supplied by the Ministry of Finance.

Table. 25. Export of smallholders' rubber from Indonesia, 1953–1959.

	Export in 1000 tons	Value in million US $		Export in 1000 tons	Value in million US $
1953	395.3	133.9	1960	387.8	243.2
1954	495.8	166.4	1961	443.8	184.6
1955	476.7	259.7	1962	482.3	196.9
1956	429.3	206.2	1963	–	147.4
1957	418.2	203.6	1964	–	135.2
1958	377.7	153.2	1965	–	135.4
1959	485.3	275.9			

Source: For the quantities: *Statistik Konjunktur*, monthly survey November/December 1962, p. 47. For the values: *Warta Biro Pusat Statistik 1 (7)*, December 1966, Table 8.

Table 26. Exports of smallholders' rubber from the main production areas in Indonesia (in metric tons of dry rubber), 1938 and 1955–1959.

	1938	1955	1956	1957	1958	1959
West Borneo	30,354	77,895	74,168	84,853	82,523	74,671
South and East Borneo	27,390	69,627	52,664	62,698	61,275	66,954
Palembang	23,964	84,950	77,645	59,247	51,767	96,496
East Sumatra	20,280	58,243	53,705	52,881	54,731	64,863
Djambi	22,206	57,244	56,283	43,876	35,237	55,791
Tapanuli	4,044	6,077	9,254	8,248	5,823	10,366
Lampung	5	15,288	28,794	29,306	22,216	35,784
Other areas	18,353	95,922	60,833	66,047	55,419	69,703
Total reported exports	146,596	464,876	413,346	407,156	368,991	474,628

Note: There is a discrepancy between the figures given above and those in Table 25 due to the fact that Table 26 reports only the exports reported to the bank.

Sources: *Report of the Bank Indonesia 1958–1959*, p. 185 and *1959–1960*, p. 158. After 1959 the publication of this bank was suspended.

Table 27. Production index numbers[1] of principal export products, Indonesia, 1958–1961 (1938 = 100).

	1958	1959	1960	1961
Estate products				
rubber	140	130	125	131
tea	60	55	57	54
palm oil	65	61	62	64
coffee	28	42	40	41
cinchona bark	37	37	33	26
hard fibres	30	24	21	18
cane sugar	55	61	48	46
tapioca flour	–	–	6	–
tobacco leaves	17	15	18	18
tobacco, cut	9	20	16	12
weighed average (including rubber)	72	69	65	65
weighed average (excluding rubber)	47	48	43	41
Farm products[2]				
rubber	252	325	258	293
coffee	60	82	91	150
tapioca flour	–	1	–	–
copra	24	25	31	44
pepper	23	53	23	34
weighed average (incl. rubber)	147	185	155	182
weighed average (excl. rubber)	29	38	38	57
Mining products				
crude petroleum	218	246	278	288
tin	85	79	83	68
bauxite	140	58	161	171
coal	41	44	45	38
average	185	206	231	236
General average (incl. rubber)	124	137	139	145
General average (excl. rubber)	108	118	128	131

[1] Based on LASPEYRES formula.
[2] Products for export. The export data indicate the progress of production.

Source: *Statistik Konjunktur Nov./Dec. 1962*, p. 11.

Table 28. Shares of the principal products in the export of Indonesia, 1928, 1938 and 1950–1958.

	Rubber	Copra	Tea	Tobacco	Palm oil + kernels	Sugar	Other export products
1928	17.6	6.8	6.2	6.1	0	23.8	39.5
1938	22.6	5.7	8.3	3.9	2.8	6.5	50.2
1950	41.8	7.7	3.7	2.9	3.4	0	40.5
1951	51.9	10.2	2.9	2.2	3.0	0	29.8
1952	46.0	5.6	2.6	1.9	3.3	0	40.6
1953	33.0	6.9	2.9	2.9	4.1	1.2	49.0
1954	30.9	6.7	4.6	3.8	3.6	2.6	47.8
1955	46.0	4.6	3.3	3.0	2.9	2.0	38.2
1956	40.3	4.4	3.4	3.3	3.4	1.9	43.3
1957	36.0	4.4	3.1	3.5	3.1	1.8	48.1
1958	34.6	2.2	3.3	4.0	3.6	1.2	51.1

Source: B. NAPITUPULU, *Die Probleme der indonesischen Aussenwirtschaft seit 1950*, Hamburg, 1962, p. 103.

Table 29. Export of copra from Indonesia, 1938 and 1954–1965.

	Quantity in 1000 tons	Value in million US $		Quantity in 1000 tons	Value in million US $
1938	556.5	21.3	1959	131.2	27.6
			1960	107.4	29.1
1954	298.1	51.4	1961	156.6	34.7
1955	234.4	35.4	1962	76.0	14.8
1956	260.4	39.2	1963	–	13.6
1957	297.4	40.5	1964	–	23.5
1958	116.9	18.2	1965	–	17.9

Source: Compiled from several publications.

Table 30. Copra purchased by the Copra Foundation in Indonesia (in 1000 tons net), 1953–1961.

	East Indonesia	West Borneo	Other Areas	Total
1953	406.0	55.3	–	461.3
1954	351.8	50.0	–	401.8
1955	309.7	56.1	–	365.8
1956	281.3	44.2	13.6	339.1
1957	107.3	19.2	7.4	139.3
1958	3.9	43.7	55.0	102.6
1959	1.5	37.5	66.3	105.3
1960	236.9	32.0	16.7	285.6
1961	237.2	23.9	8.7	269.8

Source: Compiled from several publications.

Table 31. Export of pepper from Indonesia, 1938 and 1954–1962.

	Net weight in 1000 tons	Value in million US $		Net weight in 1000 metric tons	Value in million US $
1938	54.5	4.7	1958	12.6	5.0
			1959	29.3	12.1
1954	12.9	12.7	1960	12.7	10.5
1955	13.7	10.4	1961	19.1	15.0
1956	19.4	8.9	1962	11.0	6.6
1957	17.7	8.3			

Sources: *Statistical pocketbook of Indonesia 1941*, p. 82, and *Statistik Konjunktur Nov./Dec. 1962*, p. 47 and p. 51.

Table 32. Harvested areas of most important food crops in Indonesia in 1000 ha[1], averages for 1953/1962, and years 1960–1963.

	1953/1962	1960	1961	1962	1963
Paddy	6,872	7,285	6,858	7,283	6,727
Maize	2,412	2,640	2,462	3,175	2,534
Cassava	1,207	1,417	1,478	1,449	1,559
Sweet potatoes	382	394	366	544	444
Peanuts	338	377	365	372	348
Soybeans	560	651	625	594	540
Total	11,771	12,764	12,154	12,417	12,152

[1] No data available after 1963.

Source: Central Bureau of Statistics, *Production of principal foodstuffs in Indonesia*, 1963, pp. 1–8.

Table 33. Harvested areas of most important food crops in Indonesia, 1953–1962 (in 1000 ha).

	Irrigated paddy + gogoran-tjah	Non-irri-gated paddy	Total paddy	Maize	Cassave	Sweet potatoes	Peanuts	Soy-beans
1953	5380	1085	6465	1969	1042	325	292	457
1954	5469	1144	6613	2518	1071	285	324	525
1955	5517	1053	6570	2042	1077	279	298	515
1956	5701	1001	6702	2232	1125	384	317	502
1957	5748	1050	6798	2087	1221	404	341	525
1958	5914	1076	6990	2702	1341	449	331	594
1959	5936	1217	7153	2290	1456	394	364	612
1960	5975	1310	7285	2640	1417	393	377	651
1961	5534	1273	6858	2462	1478	366	365	625
1962	–	–	7283	3175	1449	544	372	594

Sources: *Statistical pocketbook of Indonesia 1963*, p. 69; for 1962: Central Bureau of Statistics, *Production of principal foodstuffs in Indonesia*, 1963, pp. 1–8.

Table 34. Production of most important food crops in Indonesia in 1000 tons; average for 1953/1962, and the period 1960–1966.

	Average 1953/1962	1960	1961	1962	1963	1964	1965[1]	1966[2]
Milled rice[3]	8,009	8,430	7,950	8,556	7,628	8,896	9,800	9,986
Maize kernels	2,012	2,460	2,283	3,243	2,359	3,769	2,283	3,005
Cassava roots	9,477	11,376	11,190	11,386	11,575	12,223	11,274	10,845
Sweet potatoes	2,296	2,669	2,464	3,680	3,015	3,931	2,724	2,309
Shelled peanuts	213	256	252	261	231	261	279	293
Shelled soybeans	351	442	426	397	353	392	356	353

[1] Preliminary figures.
[2] Targets.
[3] Ratio of dry stalk paddy: clean rice = 100:52.

Sources: Central Bureau of Statistics, *Production of principal foodstuffs in Indonesia*, 1963, pp. 1–8 for average 1953/1962; for 1960–1966: data supplied by Indonesian authorities.

Table 35. Production of most important food crops in Indonesia, 1953–1962 (in 1000 tons).

	Irrigated paddy + gogoran-tjah[1]	Non-irri-gated paddy[1]	Total paddy[1]	Maize (shelled)	Cassava (fresh roots)	Sweet potatoes (fresh roots)	Peanuts (shelled)	Soy-beans (shelled)
1953	12,655	1,409	14,064	1,815	8,953	2,176	204	306
1954	13,342	1,719	15,061	2,720	9,569	2,111	248	400
1955	12,985	1,447	14,432	1,971	9,317	1,898	207	346
1956	13,308	1,311	14,619	1,965	9,131	2,638	218	357
1957	13,242	1,435	14,677	1,860	10,118	2,653	232	339
1958	13,881	1,463	15,344	2,634	11,278	3,103	232	418
1959	14,228	1,722	15,950	2,092	12,697	2,877	256	431
1960	14,876	1,984	16,860	2,460	11,376	2,670	256	443
1961	13,935	1,965	15,900	2,283	11,190	2,464	252	426
1962	14,855	2,256	17,212	3,243	11,386	3,680	261	397

[1] Dry stalk paddy.

Sources: *Statistical pocketbook of Indonesia 1963*, p. 71; for 1962: Central Bureau of Statistics, *Production of principal foodstuffs in Indonesia*, 1963, pp. 1–8.

Table 36. Average yield of most important food crops in Indonesia, in 100 kg per ha, for the period 1953/1962 (average) and the years 1960–1963.

	Average 1953/62	1960	1961	1962	1963
Paddy	22.41	23.14	23.19	23.50	22.68
Maize	8.34	9.32	9.27	10.21	9.31
Cassava	75	80	76	79	74
Sweet potatoes	60	68	67	68	68
Peanuts	6.30	6.79	6.91	6.99	6.63
Soybeans	6.26	6.80	6.82	6.68	6.53

Source: Central Bureau of Statistics, *Production of principal foodstuffs in Indonesia*, 1963, pp. 1–8.

Table 37. Harvested areas (in 1000 ha) of principal farm food crops in different regions, 1962.

	Irrigated paddy + gogoran-tjah	Non-irri-gated paddy	Total paddy	Maize	Cassava	Sweet pota-toes	Pea-nuts	Soy-beans
Java and Madura	3707	384	4091	2352	1136	350	293	514
Sumatra	933	507	1440	85	80	49	24	21
Borneo	403	258	661	19	33	5	2	3
Celebes	498	134	632	398	78	40	26	8
Moluccas/West Irian	–	7	7	8	9	9	2	–
Lesser Sunda Islands	313	132	445	281	71	94	24	48

Source: *Statistical pocketbook of Indonesia 1963*, p. 69.

Table 38. Production of principal farm food crops in different regions, 1962 (in million kg).

	Irrigated paddy + gogoran-tjah[1]	Non irri-gated paddy[1]	Total paddy[1]	Maize (shel-led)	Cassava (fresh roots)	Sweet pota-toes (fresh roots)	Pea-nuts (shel-led)	Soy-beans (shel-led)
Java and Madura	9305	695	10000	2450	8120	2000	202	337
Sumatra	2954	847	3801	84	1170	603	15	17
Borneo	709	287	996	14	333	29	2	2
Celebes	1241	209	1451	397	631	245	18	4
Moluccas/West Irian	–	5	5	7	90	31	1	–
Lesser Sunda Islands	838	123	961	249	630	830	20	36

[1] Dry stalk paddy.

Source: *Statistical pocketbook of Indonesia 1963*, p. 71.

Table 39. Principal foodstuffs available in kg per capita, *Indonesia, 1958–1962.*

	Cereals			Roots			Total rice equivalent of cereals and roots	Pulses		
	rice	maize	total cereals	cassava roots (fresh)	sweet potatoes (fresh)	total roots		peanuts (shelled)	soy-beans (shelled)	total pulses
				Production minus seed for sowing						
1958	88.8	29.2	118.0	128.5	35.3	163.8	181.6	2.3	4.4	6.7
1959	89.7	22.5	112.2	140.6	31.9	172.5	179.0	2.5	4.4	6.9
1960	91.6	25.6	117.2	121.6	28.5	150.1	175.6	2.4	4.4	6.8
1961	83.9	23.1	107.0	116.1	25.6	141.7	162.1	2.3	4.1	6.4
1962	88.9	31.7	120.6	111.4	37.9	149.3	178.7	2.3	3.7	6.0
				Production minus seed for sowing plus import minus export						
1958	96.8	29.2	126.0	127.9	35.3	163.2	189.4	2.3	4.4	6.7
1959	96.5	22.5	119.0	136.6	31.9	168.5	184.2	2.4	4.4	6.8
1960	101.9	25.6	127.7	118.7	28.5	147.2	184.6	2.4	4.4	6.8
1961	92.5	23.3	115.8	124.4	26.4	150.8	174.5	2.2	4.1	6.3
1962	94.3	31.7	126.0	111.1	37.9	149.0	178.6	3.2	3.7	5.9

Source: *Statistical pocketbook of Indonesia 1963*, p. 245.

Table 40. Imports of rice in Indonesia, 1938–1940 and 1958–1964.

	Gross weight in 1000 tons		Gross weight in 1000 tons
1938	334	1960	966
1939	278	1961	1,065
1940	109	1962	1,064
		1963	1,070
1958	921	1964	900[1]
1959	891		

[1] Estimate.

Sources: From several publications.

Food Crops. The development of the harvested area, production and average yield of the most important food crops can be seen in Tables 32–36.

The total acreage of harvested area of the main food crops in Indonesia reached its peak in 1960 and afterward showed a declining trend. Further, the figures stress again the importance of the acreage devoted to rice production (in 1963 about 55 percent of the total acreage).

As can be seen from Tables 37 and 38, rice is grown practically everywhere in Indonesia. Corn is mostly grown in Java, Celebes and the eastern Lesser Sunda Islands. Cassava is primarily a Java crop as are sweet potatoes, peanuts and soybeans. Paddy, maize, cassava, sweet potatoes, soybeans and peanuts follow in importance in the order in which they are listed.

Since 1960 the area under paddy has shown a fluctuating tendency due to the weather conditions, and so has production. However, average production showed a different trend; it went up between 1960–1962, but dropped again in 1963.

The area under maize reached its peak in 1962 (3,175,000 ha) but dropped again to 2,534,000 ha in 1963, with corresponding declines in production (see Tables 32 and 34). The development of the average production shows the same picture as that of rice, namely a rise between 1960–1962 and a drop in 1963 (See Table 36).

The increase of average production both of rice and maize is primarily caused by the intensification program of the government, especially in Java. This will be dealt more elaborately in Chapter 9.

Regarding the *consumption* of the principal food crops, Table 39 gives the quantity available *per capita*. For each of the three important groups of food crops, cereals (rice and maize), root crops (cassava and sweet potatoes) and pulses (peanuts and soybeans), it also gives the proportion of the production consumed in Indonesia. As far as possible account has been taken of the growth of the population. It shows that

these foodstuffs supply an intake of about 1900 calories per day, which is about the average for a country in Asia and the Far East.[40]

Further we can read from this table that domestic rice production is always smaller than consumption, indicating the need to import rice after World War II (Table 40). As far as maize, sweet potatoes, peanuts and soybeans are concerned, domestic production has just balanced the consumption *per capita*. For cassava roots, there is a tendency to consume more and more, so that there is less available for export (see further Chapter 4).

The large imported quantities of rice after the war can also be seen in Table 40. As to their distribution, the 1959 JUBM (Jajasan Urusan Bahan Makanan, the Food Foundation) figures show that about 50% went to Java, namely:

Java	469,000 tons	Celebes	42,000 tons
Sumatra	255,000 tons	Moluccas + West Irian	27,000 tons
Borneo	86,000 tons	Bali + Lesser Sunda Islands	11,000 tons

Since World War II Indonesia has become a large importer of food instead of a small exporter, as was the case in 1940. The main reason has been that Java, with her rapidly growing population, is having difficulties in feeding herself. Java, which before the war exported rice to the Outer Islands, has become a food importer (primarily corn, among others from South Celebes), despite its fertile soil. The people on this island are mainly engaged in labour intensive subsistence peasant farming, handicraft and small scale manufacturing industries for domestic consumption. Nevertheless textiles and other important consumer goods have to be imported, for which the Outer Islands earn the foreign exchange, as the main development of agricultural estates and labour extensive peasant agricultural exports occur there. Here also are the mines, most oil fields and some highly efficient large-scale industries. Yet only one-third of the total Indonesian population lives scattered through these enormous areas.

It is small wonder that such discrepancy in economic conditions, stresses and strains occurs between Java and the Outer Provinces. Therefore, the central problem of agriculture in the scope of economic development for the whole of Indonesia should be focussed on Java. If a way could be found to get economic development in Java moving, the back of the problem for the whole of Indonesia would be broken.

However, before we can suggest any practical solution, we should explore more thoroughly why and how this development has occured in Java. This will be discussed in the next chapter.

The development of agriculture in Java will be discussed in the same manner as that of the whole of Indonesia, i.e. by making a division between 'estate' and 'peasant agriculture'.

[40] Direktorat Pertanian Rakjat (Agricultural Extension Service), *Sumber Hydrat Arang*, 1964, p. 1.

4 Agricultural development in Java

4.1 The period before World War II

4.1.1 Estate agriculture

Before 1870 agricultural production for export was practically confined to Java. The main products were coffee, sugar, indigo and tobacco. There were about hundred estates which leased their land from the government. Their average size was 200 to 280 ha, mostly cultivated with coffee.[41] In addition, there were 150 enterprises based on free lease agreements with village elders; these estates were mostly cultivated with sugar and tobacco. In the later part of the nineteenth century estates producing Assam tea, rubber, and cinchona were added.[42] The development of the estates after 1870 is illustrated by Table 41.

In 1937 7% of the cultivated area of Java was under estates, which were planted with various crops as shown in Table 42.[43] In that year, in terms of the area devoted to each product, rubber ranked first, followed by tea. The estates in the hills and mountains ('bergcultures') had become less important than those on the lowlands.

Up to 1930, sugar was the most important product, occupying some 60,000 permanent and more than 700,000 temporary workers. The economic crisis in 1930 reduced the area from 200,000 ha to 32,000 ha whereas labour employed was only a fraction of the previous force.[44] In 1940, though its area rose again to about 90,000 ha, there appeared to be no prospect of the industry recovering its former importance.[45]

The estates engaged in the cultivation of coffee, tea, cocoa, palmoil, cinchona and rubber obtained their land from the government. For sugarcane and tobacco a somewhat different arrangement was made.[46] The planters rented the land from village communities "either by registered communal agreements accepted by two thirds of

[41] PIM, *op. cit.* (*fn.* 9), p. 18.
[42] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 332.
[43] *Ibid.*, p. 331–332.
[44] PIM, *op. cit.* (*fn.* 9), p. 25.
[45] *Ibid.*, p. 25, and *Statistical pocketbook of Indonesia 1941*, p. 40.
[46] GEERTZ, *op. cit.* (*fn.* 7), pp. 86–87. Generally estate sugar cane was grown on the most fertile and best irrigated soils and it is estimated that the estates occupied 20 to 25% of the sawahs, primarily located in the lowlands of Central and East Java. (See ROBEQUAIN, *op. cit.*, *fn.* 9, p. 332). Tobacco plantations were based on a similar system, but the ripening of the crops takes only a few months.

the co-shares for periods up to 21½ years at a rent fixed by the government on the basis of the land revenue, or by similar private agreements but with no security of tenure beyond two crops ahead (3½ years)". The lessee could occupy at most one third of the village land at a time, the other two thirds being at the disposal of the peasants. All labourers needed for the estates could be secured from surrounding villages.

In addition to the landless peasant who had to earn his living by wage work, there

Table 41. Area of estates in Java and Madura[1], in 1000 ha, 1875–1937.

Year	Area	Year	Area
1875	264.2	1927	980.2
1890	589.6	1935	731.0
1905	899.9	1937	770.6
1920	1,108.7		

[1] Exclusive large private estates ('particuliere landerijen').

Source: See footnote 14.

Table 42. Planted area of estate agriculture by crops in Java and Madura, 1937.[1]

Crop	Area in 1000 ha	Crop	Area in 1000 ha
Rubber	222.8	Coconut	7.2
Tea	103.6	Cocoa	6.0
Coffee	89.2	Pepper	2.4
Sugarcane	82.4	Nutmeg	1.6
Tobacco	29.2	Other crops	2.4
Kapok	22.8		
Cinchona	15.2	Total	584.8

[1] Exclusive cassava and sisal.

Source: C. ROBEQUAIN, (see footnote 9) pp. 331–332.

Table 43. Export of agricultural products from estates and peasant farms in Java, in million guilders (1931-1940).

	Estate production	Peasants' production		Estate production	Peasants' production
1931	234	56	1936	112	41
1932	165	49	1937	175	57
1933	115	38	1938	140	42
1934	123	31	1939	187	39
1935	102	31	1940	193	38

Source: *Statistical pocketbook 1941*, p. 88.

were owner-cultivators with such small plots that they had to supplement their income by occasional outside work. It was estimated that one out of every four Javanese males depended on estate agriculture for at least part of his income.[47]

In the decade just before World War II, some of the agricultural products could be accounted for by peasant-produced export crops, but Table 43 indicates that by far the major portion was still the result of estates' activity. Until the thirties sugar was the main export product.[48] Even after the economic crisis, it still remained an important crop. The value of this product exported from Java in 1937 was only slightly lower than that of rubber.[49]

In 1939, Java was still capable of supplying a considerable share in the world's needs for tropical products: 13% of the world's tea, 7% of its rubber, 5% of its sugar and 91% of its cinchona bark.[50]

Large investments made in estate agriculture initiated a process of economic development. Roads, railroads, irrigation works, and other overhead capital works were constructed.[51]

Estates and sugar factories provided hundreds of thousands labourers with additional income. Thousands of farmers received a cash revenue from the rent of their land leased to sugar and tobacco estates. Yet this all did not basically transform the peasant agricultural economy in Java: it remained mainly a subsistence agriculture with additional cash income from the purchase of cash crops, surpluses of food crops and employment on estates, in factories and in trade.

4.1.2 Peasant agriculture

The total arable areas of peasant agriculture in the period 1900–1940 are given in Table 44. It shows that a separation can be made between sawah's (wet cultivation) and dry fields.

Wet Cultivation (Sawah's). PELZER indicated that the first European irrigation system was laid down in Buitenzorg (now Bogor) during the regime of Governor General VAN IMHOFF (1743–1750).[52] According to GEERTZ in 1833, 1,270,000 ha was being irrigated.[53] However, the great expansion occurred between 1880–1940.[54]

PELZER said that the first large project was built in the 1880's in the residency of

[47] J. E. METCALF, *The agricultural economy of Indonesia*, Washington, 1952, p. 50.

[48] GEERTZ, *op. cit.* (*fn. 7*), p. 86.

[49] ROBEQUAIN, *op. cit.* (*fn. 9*), p. 332.

[50] N. ZINKIN, *Asia and the West*, New York 1952, p. 133, and *Statistical pocketbook of Indonesia 1941*, p. 37.

[51] After 1910 the construction of irrigation works by the government was mainly carried out in the non-sugar region of Java. The irrigation works established before 1910 were concentrated in the cane growing areas, often with financial assistance of the sugar companies. (Professor JOOSTEN, personal communication).

Semarang, where famines were frequent. Since then irrigation systems in Java have been steadily enlarged. At the end of 1938 the total wet-rice area of Java and Madura amounted to 3,368,000 ha. Of these, 1,204,000 ha were technically irrigated, an additional 1,500,000 ha were cared for by peasants' works, and the remaining 664,000 ha depended upon rain-water.[55] Since 1938 the total irrigated area has not increased very much.

Exact data on the introduction of big irrigation projects are difficult to obtain. A modern technique is necessary to harness the large rivers, a feat for which the traditional skill of the peasant is quite inadequate.

The expansion of the sawah area also resulted in an increase of the percentage of land being able to produce two crops a year; this double cropping causes the data in the last column of Table 45 to exceed 100%. Where sufficient water is available, the second crop is also rice. Otherwise crops such as maize, cassava, sweet potatoes and soybeans are cultivated during this season.

Notwithstanding this expansion, and the additional application of better working methods and new crop varieties, the increase in production could not neutralize the rapid population growth in Java.

After the rice harvest the sawah's are inundated, and in that way they serve to raise fish, highly important as a supplement to the diet which is generally poor in proteins. Small fresh water fish ponds are often an adjunct to the kampong (village) and by keeping these ponds well stocked the villagers always have fresh fish on hand.

Dry field cultivation. Just before World War II, 4,500,000 ha out of 7,900,000 ha of cultivated land of smallholders in Java was utilized for dry field cultivation. These dry fields are known as tegalan; corn, cassava, peanuts, soybeans and sweet potatoes are the principal food crops grown there.[56] They include the compounds which make an important contribution to agricultural production because they contain a wide variety of fruits and vegetables such as beans, cucumbers, melons, bananas, papayas and mangoes. The acreage of such gardens in Java has been estimated at about 1,300,000 ha[57] They are also useful for raising chickens.[58]

[52] K. J. PELZER, *Pioneer settlements in the Asiatic tropics: Studies in land utilization and agricultural colonization in southeastern Asia*, New York, 1948, p. 54.

[53] GEERTZ, *op. cit.* (*fn.* 7), p. 34.

[54] The increasing concern with the welfare of the peasants, beginning in 1880, caused that attention was directed towards the problem of irrigation works. The expansion of peasant agricultural land in Java and the distribution between irrigated and dry fields have already been illustrated in Table 44.

[55] PELZER, *op. cit.* (*fn.* 52), p. 54.

[56] J. J. VAN HALL and C. VAN DE KOPPEL, *De landbouw in de Indische Archipel*, The Hague, 1946–50 (3 volumes) Vol. I, p. 363.

[57] *Ibid.*, p. 364.

[58] METCALF, *op. cit.* (*fn.* 47), p. 18. According to TERRA the diet of the Javanese family is more varied primarily by the extreme intensification of the compounds (see GEERTZ, *op. cit.*, *fn.* 7, p. 96). The increased variation in the diet after 1915 compensates the declining consumption of rice *per capita.*

Table 44. Arable land for peasants' agriculture in Java and Madura, in 1000 ha (1900 to 1940).

	Sawahs	Dry fields	Total		Sawahs	Dry fields	Total
1900	2,700	2,900	5,600	1931	3,288	4,370	7,658
1921	3,136	3,793	6,929	1933	3,299	4,404	7,703
1924	3,194	3,897	7,091	1937	3,363	4,487	7,850
1927	3,222	4,243	7,465	1940	3,384	4,544	7,928
1930	3,274	4,372	7,646				

Source: A. JONKERS, (see footnote 14) pp. 65–66.

Table 45. Total arable and harvested area of farm crops in Java and Madura, 1931–1940.

	Arable area in 1000 ha	Total harvested area in 1000 ha	Harvested area in % of arable area
1931	7,658	7,687	100.3
1932	7,685	7,992	103.9
1933	7,703	8,311	107.9
1934	7,726	8,011	103.6
1935	7,753	8,404	108.5
1936	7,799	8,778	112.5
1937	7,850	8,703	110.9
1938	7,871	8,768	111.4
1939	7,900	8,939	113.2
1940	7,928	9,122	115.2

Source: *Statistical pocketbook of Indonesia 1941*: pp. 36–37.

Table 46. Harvested areas of farm crops in Java and Madura, (1930–1940) in 1000 ha.

	Paddy and maize	Cassava and sweet potatoes	Soybeans and peanuts	Tobacco	Other crops	Total harvested area
1930	5,584	929	653	150	496	7,812
1931	5,475	955	612	172	473	7,687
1932	5,691	989	674	142	496	7,992
1933	5,982	980	725	130	494	8,311
1934	5,579	1,051	707	168	506	8,011
1935	5,871	1,126	737	147	523	8,404
1936	6,102	1,210	784	131	551	8,778
1937	5,936	1,262	799	150	556	8,703
1938	5,966	1,262	837	147	556	8,768
1939	6,058	1,323	862	139	557	8,939
1940	6,072	1,393	895	166	596	9,122

Source: *Statistical pocketbook of Indonesia 1941*, p. 37.

Table 47. Production of principal food crops in Java and Madura, (1931–1940) in 1000 tons.

	Stalk paddy		Maize (shelled)	Cassava roots	Sweet potatoes	Peanuts (shelled)	Soy-beans (shelled)
	from sawahs	from dry fields					
1931	6,483	532	1,931	5,926	966	142	128
1932	6,884	543	1,902	6,222	958	161	149
1933	7,007	525	2,127	5,831	1,142	161	181
1934	6,624	462	1,720	5,793	1,069	149	175
1935	7,226	453	1,989	6,343	1,360	144	203
1936	7,476	509	2,220	7,481	1,317	167	247
1937	7,447	442	2,037	7,637	1,182	181	269
1938	7,866	477	1,926	8,149	1,206	202	288
1939	7,915	446	1,985	8,311	1,268	181	318
1940	8,477	492	1,900	8,415	1,418	197	294

Source: *Statistical pocketbook of Indonesia 1941*, p. 37.

Table 48. Production and consumption per head of the principal food crops in Java (1929–1940).

	Cereals			Root crops			Peanuts			Soybeans		
	prod.	cons.	%[1]	prod.	cons.	%[1]	prod.	cons.	%[1]	prod.	cons.	%[1]
1929	123	121	98	150	129	86	3.9	2.7	69	2.6	4.7	181
1930	139	134	96	155	142	92	4.0	3.0	75	3.1	4.9	158
1934	123	115	93	160	148	92	3.5	2.4	69	4.1	4.1	100
1936	141	128	91	200	176	88	3.8	2.3	60	5.6	4.9	87
1938	135	124	92	208	185	89	4.5	2.6	58	6.4	5.5	86
1939	138	122	88	215	190	90	4.0	2.0	50	7.1	6.0	93
1940	140	124	88	218	191	88	4.3	2.7	63	6.5	5.6	86

[1] Percentage of annual production consumed by local population.

Source: J. H. Boeke. *The evolution of the Netherlands Indies economy*, 1947, p. 109.

Table 49. Rice imports of the Outer Provinces by origin (1931–1938), in tons.

	From Java	From the other parts of the Outer Provinces	From abroad
1931	22,411	29,770	317,336
1932	6,234	17,087	269,519
1933	19,981	27,051	245,845
1934	32,844	54,100	210,932
1935	31,544	47,811	263,173
1936	92,822	56,574	213,202
1937	186,970	64,087	157,534
1938	67,452	74,565	303,389

Source: C. J. J. van Hall en C. van de Koppel, *De Landbouw in den Indischen Archipel*, 1946, Vol. I, p. 377.

Table 50. Per capita *rice consumption in kg in Java, for the period 1850–1940.*

	Consumption		Consumption
1850	103	1900	103
1860	97	1910	113
1870	100	1920	101
1880	120	1930	95
1890	102	1940	86

Sources: For 1850 till 1930; A. M. P. A. SCHELTEMA, *The food consumption of the native inhabitants of Java and Madura*, 1936, p. 12; for 1940: *Statistical pocketbook of Indonesia 1941*, p. 142.

Table 51. Export of tapioca products, excluding waste (1932–1940).

	Net quantity in 1000 tons		Net quantity in 1000 tons
1932	226.0	1937	417.0
1933	171.7	1938	246.8
1934	144.8	1939	279.7
1935	156.8	1940	226.5
1936	285.4		

Source: *Statistical pocketbook of Indonesia 1941*, p. 84.

Detailed studies made of garden culture show that the share of land allotted to them by the farmer and the intensity of cultivation increases as the total cropland per head decreases.

The growing use of dry fields and the cultivation of crops such as maize, cassava, sweet potatoes and soybeans have gained greatly in importance to meet the needs of the increasing population.[59] This development is of a relatively recent date: it was not until the 1885 depression that the Dutch government actively promoted the introduction of these crops, which are called collectively 'polowidjo' or 'palawidjaja.'[60]

Most of the peasant agricultural land is used for annual crops which are primarily for food production. The development of peasant farm crops during 1930–1940 can be illustrated by Tables 46 and 47.

The area covered by peasant crops for export in Java was estimated at about 550,000 ha in 1940, which was less than one fifteenth of the land under cultivation.[61] The chief export product from the lowlands grown by the farmers was derived from the so-called secondary crops. These crops included maize, cassava, groundnuts and soybeans. As indicated earlier they are grown on sawah's or on dry fields. Data of the

[59] J. VAN GELDEREN, in: *Indonesian economics (fn. 9)*, p. 136.
[60] GEERTZ, *op. cit. (fn. 7)*, p. 92.
[61] ROBEQUAIN, *op. cit. (fn. 9)*, p. 349.

export were given by BOEKE (see Table 48). For each of the four most important groups – cereals (rice and husked maize), root crops (cassava and sweet potatoes), peanuts and soybeans – he gave the total production and consumption per head and the ratio of those figures.

The production of rice and maize fluctuated with good and bad harvest years, but consumption per head remained much on the same level. The volume of root crop production in 1940 increased about 40% as compared with that in 1929. The consumption of home produced cereals decreased because of the greater export to the Outer Provinces. The rice import of the Outer Provinces is illustrated by Table 49.

Per capita rice consumption in Java is given in Table 50. Between 1850 en 1940 it dropped from 113 kg to 87 kg. There was a counter-balancing increase in the consumption of cassava and other food crops, which are inferior to rice as far as protein and vitamins are concerned.

With the increasing production of root crops and pulses, the menu of the Javanese household changed.[62] But in spite of the increasing consumption of cassava, there was still an important export of this product; indeed it was the biggest peasant export crop.[63] The export of tapioca or cassava flour is presented in Table 51.

From the other two important peasants' cash crops, *viz.* sugarcane and tobacco only the latter is exported. The area cultivated with tobacco amounted in 1938 to 147,000 ha.[64]

The export of peasant agricultural produce from Java showed a rapid expansion, as illustrated earlier in Table 4 under 2. This expansion has been possible primarily because of the role of the Chinese, who were the middlemen in the Javanese trade, and the considerable influence of the banks and great trade firms (European, American, Japanese and Chinese) with their many branches and agencies. Due to the 'open door' policy of the Dutch there was a keen competition between these firms and they tried to expand their business by accepting a low rate of profit.[65]

4.2 The period after World War II

4.2.1 Estate agriculture

In 1958, 75% of the estates, planted with sugar-cane, coffee, tea, cinchona, cocoa, tobacco and kapok were located in Java.[66] Rubber, though also an important estate crop in Java, was primarily produced in the Outer Islands, especially in Sumatra.

[62] For further particulars on the impact of the changing diet of the Javanese people see footnote 58.
[63] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 351.
[64] VAN HALL and VAN DE KOPPEL, *op. cit.* (*fn.* 56), Vol. 1, p. 364.
[65] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 350.
[66] E. JACOBY, *Agrarian unrest in Southeast Asia*, London, 1961, p. 71. Since the production of some estate crops is concentrated in Java, the development of these crops in Java and Madura after the war actually reflects the development of those for the whole of Indonesia.

The declining importance of the estates in Java and Madura is illustrated by Tables 52–54.

Sugar. Production of sugar in 1963 amounted to 650,563 tons, a decrease of about 53% as compared with 1938. The number of sugar-mills participating in the production for 1963 was 56, with a total planted area of 81,800 ha. In 1938 there were 97 mills with an area of 84.800 ha.[67] The decline in mills and area were 42 and 6% respectively. This means that production decreased more than total planted area, or in other words: production per ha declined. The average yield after World War II was indeed just about one half of that before the war.[68]

According to the figures of the Central Bureau of Statistics, the exports of sugar showed a decline from 1,071,100 tons in 1938 to 32,900 tons in 1962.[69] Part of this can be explained by a greater consumption at home. Further details of the sugar factories' development will be discussed in chapter 8.

Tea. In 1963, tea output amounted to 27,918 tons, which is a decrease of 55% since 1938. The number of estates dropped 56% and the planted area 44%. Here again the average yield per ha decreased, primarily to be attributed to lack of imported materials, such as spare parts and insecticides. There are no separate figures for Java's exports, but the figures for the whole of Indonesia seem to be sufficiently representative.[70]

Coffee. Coffee output in 1963 amounted to 19,075 tons, a decrease of 52% as compared with 1938. The number of estates dropped 57% and the planted area 53%. Thus the average yield per ha was about the same. Again no separate figures are available for Java's export, but the situation will not have been basically different.[71]

Tobacco. The development of estate tobacco can be seen from Table 55. Production of Java's estate tobacco in 1958 amounted only to 3,856 ton as compared with 20,924 tons in 1938, or a decrease of 86%. No figures are available for Java's exports, but the figures for the whole of Indonesia indicate that these exports decreased considerably.[72]

[67] See Tables 52–54.

[68] See 3.1.1.

[69] *Statistical pocketbook of Indonesia 1963*, p. 151.

[70] According to CBS-figures, the export of tea during 1962 showed a decline of 42,700 tons: from 71,900 tons in 1938 to 29,200 tons in 1962. This decrease was due primarily to the decline in production. It is believed that pressure or internal demand also limited the export (see *Statistical pocketbook of Indonesia 1963*, p. 147).

[71] The CBS-figures show that the export during 1962 declined from 69,000 tons in 1938 to 57,200 tons, a decline of 11,800 tons. The same factors, already mentioned for tea are the main causes of this decline (see *Statistical pocketbook of Indonesia 1963*, p. 148).

[72] The publication of the *Report of the Bank of Indonesia* was suspended after 1960, so that the 1958 figures on estate tobacco are the latest available. According to the figures of the Central Bureau of Statistics' the export of estate tobacco showed a decline of 37,000 tons from 48,000 tons in 1938 to 11,000 tons in 1962. (See *Statistical pocketbook of Indonesia 1963*, p. 149.)

Rubber. From Table 34 it can be seen that estate rubber production increased in 1963 by about 1% as compared with 1938. The number of estates dropped 32% and the acreage 16%, but the average production increased. Among other causes, this increase was due to overtapping. The production in 1963 could have been greater if import requirements, such as for equipment and chemicals, had been met.

However, the long-run prospect of estate rubber for the whole of Indonesia, as earlier indicated, is not very encouraging. The average yield on estates has declined after 1952 primarily due to the inability of most estates to undertake a normal replanting program and also to the gradual decline in yield per hectare as the trees become older and are not replaced.

Cocoa and Cinchona. Cocoa and cinchona production in 1963 decreased by 64 and 78% respectively as compared with the 1938 figures. Though of minor importance in the total agricultural exports, cinchona is of interest because of the almost complete monopoly in the world's production which Java held for many years before World War II.

During World War II, after supplies from Java were cut off, this monopoly was broken by synthetic anti-malaria drugs. In the post-war period output and export remained considerably below the prewar level, and the outlook is not encouraging.[73]

In conclusion it is difficult to indicate precisely the trends of export of estate crops from Java since there are no specific figures published. However, it is generally accepted that the export of estate crops, with the exception of rubber, decreased substantially. This is due to the fall in production caused by several factors mentioned while discussing the specific crops, and to increased domestic consumption.

Table 52. Number of estates in exploitation by principal crops in Java and Madura, 1938, 1962 and 1963.

	1938	1962	1963	Percentage increase (1938=100) for 1963
Sugarcane	97	54	56	–42
Hevea rubber	609	427	400	–34
Tea	297	137	131	–56
Coffee	314	140	134	–57
Cinchona	96	30	28	–71
Cocoa	30	23	20	–33
Oilpalm	6	4	4	–33
Hard fibres	39[1]	2	–	–
Tobacco	40	–	–	–
Cassava	28	–	–	–

[1] For 1938: all fibres.

Sources: for 1962 and 1963: Central Bureau of Statistics, *Planted area, production and stocks of principal estate crops, July/December 1962 and July/December 1963*, pp. 2–57; for 1938 Ibid, *De landbouw-exportgewassen, 1952*, pp. 16–44; for sugarcane in: *Hasil sensus perkebunan 1963*, Table 18.

Table 53. Planted area in ha of principal estate crops in Java and Madura, 1938, 1962 and 1963.

	1938	1962	1963	Percentage increase (1938=100) for 1963
Sugarcane	84,829	82,541	80,114	- 6
Hevea rubber	288,911	192,612	193,643	-16
Tea	105,054	58,126	58,978	-44
Coffee	88,585	42,285	41,574	-53
Cinchona	15,179	3,869	3,475	-77
Cocoa	6,172	6,585	6,259	+1
Oilpalm	890	892	892	0
Hard fibres	19,721[1]	1,000	1,206	-94
Tobacco	28,809	-	-	-

[1] 1938: all fibres.

Sources: for 1938: *De landbouwexportgewassen*, see footnote Table 52; for sugarcane in 1963: *Hasil sensus perkebunan 1963*, table 4; for the other data; Central Bureau of Statistics, see footnote Table 52.

Table 54. Production of principal estate crops in tons in Java and Madura, 1938, 1962 and 1963.

		1938		1962		1963	Percentage increase (1938=100) for 1963
Sugarcane (tel quel)		1,375,510		588,714		650,563	-53
Hevea rubber		63,606		65,425		64,345	+ 1
Tea		62,235		37,025		27,918	-55
Coffee		39,697		12,094		19,075	-52
Cinchona		10,276		2,094		2,431	-78
Cocoa		1,576		631		569	-64
Palmoil	887	960	66	70	59	60	-96
Palm kernels	73		4		1		
Hard fibres		33,564[1]		1,422		810	-
Tobacco[4]		20,924		5,782[2]		3,856[3]	-85

[1] For 1938: all fibres.
[2] Figure for 1957.
[3] Figure for 1958.
[4] For 1938, 1957 and 1958: *Bank Indonesia Report 1959/1960*, p. 178).

Sources: for 1938: *De landbouw-exportgewassen*, see footnote Table 52; for sugarcane in 1963: See Table 15; other data from Central Bureau of Statistics.

Table 55. Production of estate tobacco in Java (1938 and 1953–1956), in tons.

	Production		Production
1938	20,924	1956	3,921
1954	4,185	1957	3,782
1955	3,548	1958	3,856

Source: *Bank Indonesia Report 1959/1960*: 178.

4.2.2 Peasant agriculture

The development of the harvested farm crop area in Java and Madura after World War II can be seen in Table 56.

It appears that the total harvested area in Java and Madura expanded 13% during the period 1939–1962. This increase can be specified as follows: 8% by the more intensified use of arable land through double cropping and 5% to new arable land. These figures again demonstrate the limitations in constructing new irrigation works and to bring new arable land into production in Java (see further Chapter 11).

Data on the harvested area for the principal farm food crops in Java and Madura are shown in Table 57. It can be noted from the table that the area under paddy practically did not increase over the period 1940–1942.

The development of the production of principal farm food crops can be seen in Table 58. In 1962 rice production (dry stalk paddy) was 11% above that in 1940, that of maize was about 29% higher, and that of cassava 3% lower. For the post-war period the conclusion is that the volume of the principal food crops fluctuated without any clear trend.

The planted area and production of other crops are, with the exception of sugarcane and tobacco, only available for 1961 (Table 59).

Main food crops. The same method as applied before is followed to estimate the amounts of exported food crops. For each of the six principal items Tables 60 and 61 give the total production and the consumption *per capita* and the percentage of the production consumed by the population.

Production of cereals and rootcrops increased 18%, while the increase of population was 22% from 1953 to 1962.[74] If we compare the increase of food production in relation to the population increase for the 1940–1962 period, the picture is even less favourable: production in Java and Madura increased 7%, while the population increased 33%.[75] This resulted in a decrease in the principal foodstuffs available *per capita* from domestic production in Java and Madura since the war.

The consumption figures were kept more or less constant by the import of rice from abroad and maize from the Outer Islands, especially from South Celebes.

The amount available for export of cassava, the peasant's main export crop from Java before World War II, is declining as can be seen in Table 62. The main reason for this decrease is the expanding home consumption due to the population increase.

[73] WICKIZER, *op. cit.* (*fn.* 31), p. 92.

[74] There are no reliable figures for the 1941–1953 period. The production in 1962 was the highest available after World War II. In 1963 the production declined again.

[75] *Statistical pocketbook of Indonesia 1963*, p. 11 and pp. 69–70.

Table 56. Harvested areas of farm crops in Java and Madura during the period 1939–1941 and 1953–1962, in 1000 ha.

	Cereals[1]	Root-crops[2]	Pulses[3]	Tobacco	Sugarcane	Other crops	Total	As percentage of all arable land
1939	6,058	1,323	862	139	17	540	8,939	113.2
1940	6,072	1,393	895	166	18	578	9,122	115.1
1941	6,329	1,349	926	145	19	582	9,350	117.5
1953	5,516	1,269	917	89	22	546	8,359	102.6
1954	6,157	1,231	1.014	123	28	556	9,109	109.6
1955	5,767	1,253	967	104	43	540	8,674	104.0
1956	6,002	1,379	998	143	43	565	9,130	110.3
1957	5,867	1,499	1,054	166	35	604	9,225	110.7
1958	6,495	1,629	1,155	151	42	646	10,118	121.4
1959	6,006	1,700	1,151	166	40	633	9,696	115.5
1960	6,249	1,646	1,247	152	36	700	10,030	119.6
1961	5,815	1,593	1,153	165	29	665	9,420	112.3
1962	6,443	1,705	1,330	136	24	501	10,139	121.0

[1] Irrigated plus non-irrigated rice and maize.
[2] Cassava, sweet potatoes, potatoes, etc.
[3] Peanuts, soybeans and others.

Source; *Statistical pocketbook of Indonesia 1963*, p. 67.

Table 57. Harvested areas of principal food crops in Java and Madura, 1938–1941 and 1953–1962 (in 1000 ha).

	Irrigated paddy and gogoran-tjah[1]	Non-irri-gated paddy	Total rice area	Maize	Cassava	Sweet po-tatoes	Peanuts	Soybeans
1939	3,653	375	4,028	2,030	992	197	241	415
1940	3,724	365	4,089	1,983	1,041	209	251	418
1941	3,743	357	4,100	2,229	1,003	205	259	440
1953	3,768	249	4,017	1,499	868	216	240	422
1954	3,897	260	4,157	2,000	866	174	270	478
1955	3,925	264	4,189	1,578	876	176	253	462
1956	4,076	224	4,300	1,702	899	260	264	447
1957	4,069	242	4,311	1,556	987	277	289	462
1958	4,124	265	4,389	2,106	1,075	302	283	533
1959	4,056	273	4,329	1,677	1,188	258	300	531
1960	4,006	314	4,320	1,929	1,145	250	313	577
1961	3,668	324	3,992	1,823	1,142	213	294	541
1962	3,707	384	4,091	2,352	1,137	350	293	514

[1] Gogorantjah: rice planted on dry sawahs, with sufficient rainfall later on irrigated, or the reverse.

Source: *Statistical pocketbook of Indonesia 1963*, p. 68.

Table 58. Production of principal food crops in 1000 tons for Java and Madura (1938–1941 and 1953–1962).

	Irrigated paddy and gogoran-tjah	Non-irri-gated paddy	Total paddy	Maize (shelled)	Cassava (fresh roots)	Sweet po-tatoes (fresh roots)	Peanuts (shelled)	Soybeans (shelled)
1939	7,915	446	8,361	1,985	8,311	1,268	181	318
1940	8,477	492	8,969	1,900	8,415	1,418	197	294
1941	8,467	526	8,994	2,433	8,736	1,475	210	338
1953	8,239	282	8,521	1,302	6,468	1,231	164	274
1954	8,878	385	9,263	2,154	6,430	1,064	204	362
1955	8,525	289	8,814	1,462	6,519	1,008	178	306
1956	8,902	244	9,146	1,431	6,420	1,503	178	311
1957	8,839	277	9,116	1,309	7,168	1,595	192	299
1958	9,237	307	9,544	2,012	8,100	1,750	192	380
1959	9,386	332	9,718	1,475	9,082	1,490	200	375
1960	9,234	423	9,657	1,779	8,624	1,394	211	388
1961	8,740	495	9,236	1,706	8,443	1,216	203	376
1962	9,305	695	10,000	2,450	8,120	1,200	202	337

Source: *Statistical pocketbook of Indonesia 1963*, p. 70.

Table 59. Planted area and production of principal farm grown (non-estate) commercial crops in Java, 1961.

		Area in 1000 ha	Production in 1000 tons
Coconuts	dry copra	534.1	275.2
Coffee	dry beans	56.5	9.1
Tea	dry green tea	64.4	37.7[1]
Kapok	seeded fibre	131.4	18.5
Arecanuts	dry, cut nuts	11.0	4.3
Pepper	dry seeds	1.4	0.3
Cloves	dry flowers	7.3	0.1
Nutmeg	dry nut + mace	0.1	–
Sugarcane	brown sugar	27.1[3]	193.6[2]
Tobacco	dried	161.8[3]	64.3

[1] Including the production of wet leaf purchased and processed by estate factories. This quantity amounted to 7000 tons (calculated on dry green product).
[2] Inclusive the production of cane used for chewing and that processed by estates' factories. The latter quantity amounted to 58, 270 tons of brown sugar.
[3] The area refers to the area harvested during 1961.

Source: *Statistical pocketbook of Indonesia 1963*, p. 74, 75, 76, 77.

Table 60. Production and consumption (in kg), and consumption as a percentage of production of the principal foodstuffs per capita *in Java, 1936–1940 and 1958–1962.*

	Rice			Maize			Fresh cassava roots			Fresh sweet potatoes			Shelled peanuts			Shelled soybeans		
	Prod.	Cons.	%[1]	Prod.	Cons.	%[1]	Prod.	Cons.	%[1]	Prod.	Cons.	%[1]	Prod.	Cons.	%[1]	Prod.	Cons.	%[1]
1936/40	89.0	86.2	97	42.2	40.4	96	171.3	153.8	90	27.4	27.4	100	3.6	2.4	67	5.6	5.4	96
1958	85.1	90.9	107	34.4	34.2	99	142.2	139.4	98	30.7	30.7	100	2.9	2.6	83	6.2	6.5	105
1959	84.3	87.5	104	24.5	24.3	99	155.0	146.7	95	25.4	25.4	100	2.9	2.6	83	6.0	6.3	105
1960	80.7	89.7	111	28.5	28.4	100	141.9	141.8	100	22.9	22.9	100	3.7	3.3	89	5.9	6.6	112
1961	75.0	79.9	107	26.5	25.7	97	134.9	134.3	100	19.4	19.2	100	2.8	3.1	117	5.6	6.3	112
1962	79.7	83.5	105	37.4	37.1	99	127.1	125.3	99	31.3	31.3	100	2.8	2.7	96	4.9	5.1	104

[1] % = (consumption: production) × 100.

Source: Computed from Table 1 in *Statistical pocketbook of Indonesia 1963*, p. 245.

Table 61. Production and consumption (in kg), and consumption as a percentage of production of the principal food foodstuffs, per capita, *in Java and Madura, 1936–1940 and 1958–1962.*

	Total cereals			Total roots			Total rice equivalent of cereals and roots			Total pulses		
	prod.	cons.	%	prod.	cons.	%	prod.	cons.	%	prod.	cons.	%
1936/1940	131.2	126.6	95	198.7	181.2	91	209.1	197.7	94	9.2	7.8	85
1958	119.5	125.1	105	172.9	170.1	98	176.2	191.5	109	9.1	9.1	100
1959	108.8	111.8	103	180.4	172.1	96	178.9	178.7	100	8.9	8.9	100
1960	109.2	118.1	109	164.8	164.7	100	173.5	182.4	105	9.6	9.9	103
1961	101.5	105.6	104	154.3	153.5	99	161.7	165.5	102	8.4	9.4	112
1962	117.1	120.6	103	158.4	156.6	99	179.2	178.2	99	7.7	7.8	101

Source: Computed from Table 1 in *Statistical pocketbook of Indonesia 1963*, p. 245.

Tobacco. The area under peasant tobacco has regained its prewar value and so has the production[76], but exports have decreased, as is apparent from the figures for 1958.[77] The main reason is the rise in home consumption of cigars, cigarettes, native straw cigarettes and cut tobacco manufactured in local industries.[78]

Table 62. Export of tapioca products excluding waste, from Java, (1938–1940 and 1958–1962), in 1000 tons.

1938	246.8	1959	144.3
1939	279.7	1960	104.2
1940	226.5	1961[1]	78.9
1958	21.1	1962	10.0

Note: postwar data prior to 1965 not available.

Source: *Statistical pocketbook of Indonesia 1963*, p. 155.

Table 63. Average yield of preasants' sugar per ha in Java, 1957–1961.

Year	1957	1958	1959	1960	1961
Average production in tons per ha	6.92	6.60	6.54	7.13	8.68

Source: *Statistical pocketbook of Indonesia 1963*, pp. 74–77.

Table 64. Average yield of peasants' tea per ha in Java, 1957–1961.

Year	1957	1958	1959	1960	1961
Average production in tons per ha	0.371	0.394	0.510	0.587	0.585

Source: *Statistical pocketbook of Indonesia 1963*, pp. 74–77.

Table 65. Export of kapok from Java, 1938–1940 and 1958–1962.

Year	1938	1939	1940	1958	1959	1960	1961	1962
Quantity in 1000 ton	16.3	21.8	16.7	2,8	3.4	2.6	3.4	1.9

Source: *Statistical pocketbook of Indonesia 1963*, p. 154.

[76] Production in 1938 was estimated to be 66,100 tons, of which 14,549 were exported (see VAN HALL and VAN DE KOPPEL, *op. cit., fn.* 56, Vol. 1, p. 383 and table 56 for the cultivated area in 1939).
[77] Total export of tobacco including of estates amounts to 22,060 tons of which only 841 tons came from the peasants. The export of peasants' tobacco is from Java (see: Central Bureau of Statistics, *Statistik konjunktur*, May–June 1963, p. 46, and *Bank Indonesia Report 1958/'59* p. 205).
[78] It appears that the government has favoured the tobacco manufacturing industry, perhaps because of its importance as a revenue earner.

Sugarcane. In 1958 peasants' sugarcane covered an area of 42,000 ha as against 24,000 ha in 1962. But the postwar cultivated area has always surpassed that before the war, as can be seen from Table 56. Production shows an increasing tendency and so has the average production as can be seen in Table 63.

The increase in average production per hectare may be explained by the assistance given by the 'Jajasan Tebu Rakjat' or 'Jatra' (the Smallholders' Sugar-cane Foundation), instituted by the Ministry of Agriculture and by the 'Kantor Penjelidikan Gula Tebu Rakjat' (Smallholders' Cane Sugar Research Office) in Solo.[79] The Jatra helps the farmers with credit. The research office in Solo attempts to improve the quality of smallholders' cane and to encourage the development of smallholders' sugar enterprises. It also designs milling machines for the small cane planters. Most of the peasant sugar-cane is consumed locally.

Tea. The area under peasant tea was more or less constant[80], but production per hectare showed an increase so that the average yield went up, as can be seen from Table 64. This increase is primarily due to the re-establishment of security in the tea growing area in West Java after 1958, which made it possible for the peasants to combat the blister blight successfully, with the assistance of the Extension Service.

Part of the product is sold to the estates as can be seen in Table 59. But export decreased, which WICKIZER explains as follows: "When the peasants of Java held 35% of the total tea acreage of Indonesia in 1940, they accounted for 18% of the volume of tea exports. Disregarding the extreme fluctuations occasioned by the war and the early postwar period of adjustments, the smallholders' share in 1954 was still 18% of a considerably reduced volume of the total export, but thereafter the proportion fell rapidly to 12% in 1955 and to 8% in 1956, while estate output and exports remained steady."[81] This decrease could be primarily explained by the increase in home consumption.

Copra. The area under the other crops mentioned in Table 59 are primarily cultivated with coconut. After World War II, the export of copra decreased, mainly due to a decline in production per tree because of aging and to the increase in domestic demand by the growing population. Java, before the war an exporter of copra, became an importer.

Kapok. Export of kapok, a minor Indonesian export product and primarily grown by peasants in Java, has also declined as shown by Table 65.

Before the war, Indonesia was by far the leading exporter of kapok, but in recent years shipments have been reduced to a fraction of its previous level. Decline in world demand, owing to the development of various substitutes in numerous uses, is the principal cause.

[79] But the main cause of the increase in average production is the use of more fertilizer per ha.

[80] As compared with the prewar figure, which in 1938 amounted to 66,000 ha, it remained about the same.

[81] WICKIZER, *op. cit.* (*fn.* 31), p. 65.

Summarizing it can be concluded that peasants' tea and tobacco in Java have regained their prewar production level, while sugar and cassava have surpassed it, whereas copra decreased slightly. However, as far as exports are concerned, two of the three principal prewar peasants' export crops, namely tea and cassava, show a decline. In the case of copra, Java has even to import it from the Outer Islands. The decrease of the various exports after the war was to be expected in the context of a rapidly growing population, since peasants' agriculture exports consist primarily of food items and table luxuries.

4.3 Concluding Remarks

As explained under 4.2.2, even the smaller export of cassava and the larger import of rice could not prevent a lower consumption of principal foodstuffs, as illustrated by Tables 60 and 61. To face this most unfavourable situation, the government launched a three-year program to achieve self-sufficiency in rice. This program was called the 'Swa Sembada Beras' (SSB, Self-sufficiency in Rice Production). It is primarily designed for Java and required an increase of paddy output sufficient for home consumption from 1962 west monsoon rice harvest onwards. This three year plan, initiated in 1959, is incorporated in the Eight Year's National Overall Development Plan 1961–1969 for agriculture, along with a number of other projects in the food and fibre area which will be discussed more elaborately in Chapter 6.

The question of foreign exchange earnings, their allocation and the whole politico-economic problem involved, is a very serious one for the government to be solved, due to the precarious position of overcrowded Java. This island, with about two thirds of Indonesia's population, contributed only 15% to the export earnings in the postwar period but uses most of the total earnings to finance its imports, with the foreign currency mainly provided by the Outer Provinces.

In addition, non-agricultural employment is not able to absorb the net increase of the rapidly growing population so that agriculture has to take most of the burden. Since for decades there has been a shortage of land and a surplus of labour in Java, all this means that the Javanese economy has thus descended to a very serious situation. Something should be done to lift Java from its present state.

In the following chapters the attempted measures of the government to relieve the population pressure on Java will be discussed. But to understand the scope of the problem and the conditions giving rise to those measures, it will be helpful to precede with a brief description of Java's agriculture (Chapter 5).

5 The agricultural situation in Java

Productivity in agriculture is a function of soil, climate and the skill of the farmer. Nature certainly has favoured Java's agricultural development. Yet it is evident that the rapid population growth of this island is a factor of primary importance in determining the future course of agricultural development.

In an agrarian economy of the type found in Java, any increase in the number of inhabitants is followed by an attempt to extend the area under cultivation. But where new land becomes increasingly scarce, pupolation growth is also followed by more intensive cultivation methods. This is the case in Java where little room for further extension of the agricultural area is left and where labour intensity under the existing conditions is approaching its limit. Fortunately there is room for much improvement in methods, such as the use of fertilizers, better seed, and the distribution of irrigation water, which clearly could raise productivity. The posibilities of changes in techniques will be discussed in Chapter 9. As an alternative solution, efforts have been directed towards agricultural resettlement in less densely populated parts of the Outer Provinces. This will be discussed in Chapter 7.[82]

To understand the scope of the problem and the conditions giving rise to the various agricultural development programs, it will be helpful to give a description of the agricultural situation in Java. This can be accomplished by a discussion of the size of land holdings, the tenure arrangements and land productivity.

5.1 Population growth and reduction in farm size

Farm size can be expressed in land area and in terms of capital or labour input, sometimes in annual production or sales. But as in Java the land itself is the most important element in peasant agricultural production and so the area of cultivated land is traditionally used as a measure for farm size.[83]

To study the influence of population growth on the size of the farms, it is necessary to gather some information on the total area of available agricultural land. From Table 66 it appears, that Java did not much change in this respect between 1940 and 1962, in spite of the rapid population growth.

[82] Another possibility to raise the income of the Javanese farmer is the rehabilitation of the former estates, especially the sugar factories, where the farmers can earn an additional income. This will be discussed in Chapter 8.

[83] The area of cultivated land is practically the same as the area of arable land.

Table 66. Distribution of land use in Java and Madura (1940 and 1962).

	Area in 1940		Area in 1962	
	in 1000 ha	in per cent.	in 1000 ha	in per cent.
Peasant agriculture	7,994[1]	60.5	8,377	63.5
Estate agriculture	983[2]	7.4	627	4.8
Forests	3,116	23.6	2,991	21.7
Other lands	1,124	8.5	1,322	10.0

[1] Inclusive shifting cultivation.
[2] Including small holdings and horticultural areas occupied by foreigners.

Sources: For 1940: *Statistical pocketbook of Indonesia 1941*, p. 36. For 1962: Compiled from several publications.

Table 67. Growth of population for Java and Madura for the period 1815–1962.

	Total population in millions	Average % annual increase		Total population in millions	Average % annual increase
1815	4.5	–	1920	34.4	0.93
1845	9.4	2.48	1930	40.9	1.79
1860	12.5	1.94	1940	48.4	0.40
1870	16.2	2.64	1950	50.4	1.93
1880	19.5	1.87	1955	55.7	2.24
1890	23.6	1.90	1960	61.9	2.24
1900	28.4	1.86	1961	63.1	2.24
1905	30.0	1.10	1962	64.6	–

Sources: K. J. PELZER, *op. cit.*, p. 254; *Statistical pocketbook of Indonesia 1963*, p. 11.

Table 68. Various data on population and size of peasant agricultural area in Java and Madura.

	Population in millions	Number of peasants in millions	Total arable area in million ha	Average area of arable land in ha	
				per peasant	per landtax paying landowner
1900	28.4	–	5.6	–	–
1922	–	–	–	–	1.15
1938	–	–	–	–	0.86
1930	41.8	7.6	7.6	1.00	–
1940	48.4	–	7.9	–	–
1961	63.0	12.7	8.4	0.66	–

Sources: The population figure for 1900 and the last column are from K. J. PELZER, *op.cit. (fn. 52)*, p. 254; the population figures for 1930, 1940 and 1961 are from: *Statistical pocketbook of Indonesia 1963*, p. 11; the number of peasants is from the same pocketbook but for 1941 (p. 14) and that for 1963 (p. 272). The total area figure is from *A.* JONKERS, *Welvaartszorg in Indonesië, een geschiedenis en een perspectief*, pp. 65–66, and from *Statistical pocketbook of Indonesia 1963*, p. 66.

Table 69. Numbers of farms (over 0.1 ha) by size of area, Java, 1963.

Area (ha)	Djakarta	West Java	Central Java	East Java	Jogjakarta	Total
0.10–0.49	14,640	1,205,857	1,378,675	1,358,650	194,612	4,252,434
0.50–0.99	4,130	525,412	731,946	813,603	82,617	2,157,708
1.00–1.49	1,970	216,462	276,163	335,062	28,830	858,487
1.50–1.99	960	83,567	113,844	140,627	11,891	350,889
2.00–2.99	860	74,409	79,289	112,531	6,824	273,913
3.00–3.99	300	23,034	25,314	38,230	1,758	88,636
4.00–4.99	140	10,714	10,092	14,583	454	35,983
5.00 or more	120	11,929	8,020	13,147	651	33,867
Total	23,120	2,151,384	2,623,343	2,826,433	327,637	7,951,917
Livestocks holdings	20	537	700	731	–	1,988
Total holdings	23,140	2,151,921	2,624,043	2,827,164	327,637	7,959,905

Source: Central Bureau of Statistics, *Hasil sensus pertanian 1963*, p. 1.

Table 70. Per capita *area of arable land (in ha) of peasant agriculture in Java and Madura, 1939–1941*[1] *and 1953–1962.*[2]

1939	0.170	1953	0.157	1958	0.147
1940	0.167	1954	0.157	1959	0.141
1941	0.166	1955	0.155	1960	0.138
		1956	0.151	1961	0.138
		1957	0.150	1962	0.135

[1] *Per capita* of total population.
[2] *Per capita* of the Indonesian population.

Source: *Statistical pocketbook of Indonesia 1963*, p. 66.

As to this growth it can be remarked that, before 1815, the death rate was very high because malaria, hookworm, and other diseases were widespread. The establishment of modern health services, initiated by the Dutch government, has mainly been responsible for the following phenomenal population increase as illustrated in Table 67. Population increased with 122%, the area of peasant agriculture with only 50% during the six decades.

In the beginning, this increase did not hamper development, as there was enough additional land available. But since 1922, there appeared more mouths to be fed than there was new land to be occupied. This resulted in a steadily increasing pressure on land, as apparent from Tables 68 and 69. This led to a reduction in the average area of arable land per farm from 1.00 ha in 1930 to 0.66 ha in 1961, mainly caused by subdivision of holdings which were sometimes splitted up in as many as five to six small plots. Comparison of the 1961 census with an earlier census indicates that during the last 30 years the average arable land per peasant in Java is slowly decreasing in size with the steady growth of population. In 1930, for example, the average arable land per

peasant was about 1.00 ha, one half larger than in 1961.[84]

Of the 1.00 ha mentioned above, in 1930, 0.43 ha was sawah, 0.57 ha belonged to dry fields or gardens.[85] In 1961 these data were 0.28 and 0.38, respectively.[86] This reduction also appears from the fact that the number of landowners who have to pay taxes increased at a faster rate than the area subjected to this tax (Table 68, last column). The postwar development shows a further reduction in farm size, as can be seen from Table 70.

The Javanese peasant can support himself and his family on his dwarfsize holding only through double cropping and intensive cultivation (apart from additional work outside his farm). The consequence is, that he has to grow primarily food crops, so that little land remains for commercial crops and the cash receipts are small. This also causes the structure of the agricultural labour to be characterized by the dominance of the family unit. But such dwarf units are uneconomic because they do not require the full services of the family. This gives rise to idleness and concealed unemployment. Occasionally this situation is partly solved by several members of the family occupying themselves with handicrafts.

5.2 Tenure arrangements and debts

The Agrarian Law of 1870 stipulated that native land ownership, both individual and communal, was to be protected by the government and that such land could not be sold to non-natives. This prohibition was of fundamental importance, for it prevented legal ownership of land from passing into the hands of foreigners, many of whom were anxious to obtain it.

Though Indonesians were not forbidden to sell their land to autochthonous fellow-citizens[87], landlordism was not a severe problem in the prewar period, as there were only a few rich Indonesian farmers. But after World War II there was a trend to increasing landlordism.[88] The causes included the bigger sale of land by peasants due to the insecure situation in some rural areas like in southeast Priangan, the growing speculation on land as a result of inflation, and the emergence of an Indonesian middle-class, which practically did not exist before the war. The government considers this development as undesirable. To cope with this problem it enacted the Basic Agrarian Law of 1960, comprising the fundamental regulations on agrarian policy. An upper limit between 5 and 20 ha was fixed for the size of ownership, dependent on the population density and the fertility of the soil in various regions. The expropiated land was to be redistributed to small farmers and landless peasants (see Chapter 9).

[84] See footnotes 85 and 86.

[85] JONKERS, *op. cit.* (*fn.* 14), pp. 65–66.

[86] *Statistical pocketbook of Indonesia 1963*, p. 66.

[87] Fellow citizen here means of Indonesian nationality, not of foreign origin.

[88] Information supplied by officials of the Department of Agriculture and Agrarian Affairs; see also Table 69, where is indicated that about 0.4% of the number of landholdings consist of 5 ha or more.

A program for reorganizing land use, and regulations of the various landrights were included in this law.

There are no recent data on the extent of tenancy in Java as the data of the Agricultural Census of 1963 are still being processed. The only figures for Java are from HASSELMAN's study of 1903 (see ZINKIN[89]), when there were 90% owners and 10% tenants. The number of tenants today would be considerable higher, but it is still small as compared with other southeast Asian countries.

However, HASSELMAN's figures for 1903 fall short of revealing the true nature of the problem. At least 38% (HASSELMAN's estimate is 30%[90]) of the current agricultural working force on Java is estimated to be landless wage owners. Prior to the war this group was primarily employed as estate labourers. In addition, there is a large but unspecified group of small landowners who, through shortlease or debt, have lost effective control of their holdings.[91]

Among those landowners who have managed to acquire a moderate area of agricultural land, holdings generally consist of scattered small fields rather than large coherent estates worked by hired labour. The landowners then lease their land in small parcels to tenants on a share basis. The terms of the tenants' contract vary greatly and depend upon such local conditions as population pressure, fertility of the soil, and especially upon customs. As regards rice, frequently it is one half of the yield, often deducted from the 'bawon', a form of harvest payment in kind. This usually amounts to 20% of the yield which the tenants can keep for themselves. The tenants then actually get 60% of the total rice yields. Contracts vary also in regard to the division of expenses like sowing seed and tax payment.

To meet extraordinary expenses, or when in need of cash, the small peasants, excluding those who held shares of communal land, may mortgage their land. These shareholders can only lease their share to someone in the village and not to an outsider. The contract is seasonal and usually the cash rent is paid in advance.

PELZER said that "The payment is sometimes made one or two years before the land is actually put at the disposal of the lessee. The latter in most cases does not intend to cultivate the land himself but employs the lessor as tenant, or rather as subtenant, that is, he subleases the land back to the owner on a share basis and takes one half or even five sevenths of the crop. The creditors are usually merchants, who by this method assure themselves of a cheap supply of rice or occasionally individual investors, who in this way obtain high interest rates. The longer the rent is paid the lower it is."[92]

[89] ZINKIN, *op. cit.* (*fn.* 50), p. 48.

[90] *Ibid.*

[91] The agriculture census questionnaire of October 1963 was designed to cover various aspects of agriculture including land tenure. But most of the results have not yet been published, so HASSELMAN's figure had to be used here.

[92] PELZER, *op. cit.* (*fn.* 52), pp. 170–171 (for the situation before World War II). The same situation existed after World War II, maybe in certain areas even worse since there is a big demand and a short supply of agricultural credit.

Comprehensive data on the extent of indebtedness of the Javanese farmers before World War II, do not exist, but the percentage of farmers going into debt in this manner is considered to be high. Although the situation as illustrated below is not representative for Java (these figures are considerably higher than the average according to PELZER), yet it can be used to give some idea of how serious the peasants' indebtedness was in some areas. A survey made at the beginning of 1939 by SOENARIO in the Tulungagung region (East Java), indicates that out of a total of 2,470 landholding peasants, 74,2% had leased some of their land in order to obtain cash and as many as 33.9% had leased their whole property.[93]

However, before World War II, the development of moneylenders or usurers who had a strong grip on the peasants as experienced for instance in Burma, was made impossible in Java. This can be explained by three facts: (a) that alienation of land to a non-Indonesian was prohibited by the Agricultural Law of 1870, (b) that from 1900 onwards government credit agencies were set up to fight usury, and (c) that several small village banks and pawnshops were established to help the peasants meet their need of cash.

In the years of economic crisis, depression and paralyzation of the institutional credit organizations (as will be discussed later on) the peasants were forced to borrow from private moneylenders, on very unfavourable terms.

Where, before World War II, in some regions of Java and Madura, e.g. in the regency of Indramaju, this kind of indebtedness threatened to have serious consequences, the government immediately took measures to free the peasants from the inextricable net of the private creditors, and debt redemption was made possible by the Usury Ordinance of 1938.

In 3 out of the 21 villages included in the survey made by SOENARIO, every landholder leased either a part or all of his land and in 9 out of 21 villages 90% or more of all landholders had gone into debt in this fashion.

A credit survey after World War II has not yet been conducted and consequently no exact information exists as to the indebtedness of the peasants, their actual need for credit and their customary sources of credit. But the government is of the opinion that some selected regions of Java still have serious rural credit problems. Many rural credit institutions have been re-established and new ones have been added, but they are still inadequate to meet the need of the peasants.[94] With high interests rates ranging from 10 to 25% per month on small loans, peasants who have no collateral are forced to go to private moneylenders.[95] In some cases, the peasant is forced either to lease his land to the creditor as payment for his debt and actually becomes a sharecropper on his own land, or to sell his produce before harvest time at non-profitable prices.[96]

[93] *Ibid.*

[94] *Ibid.*, p. 172.

[95] The interest rate of 10 to 25% per month was mentioned in 1962 by some officials of the Bank for Cooperatives, Farmers and Fishermen. The main cause of this high rate is the rapid inflation since 1958. The present rate may be even higher, since the inflation has continued.

5.3 Technology and productivity

A survey of the trends in agricultural production and food consumption in Java must begin with rice, the key-product in Java's agriculture, as it provides over two-thirds of the population's calorific intake.

The shortage of modern technology in rice farming is shown in numerous ways: in the applied traditional techniques, in the small use of both natural and artificial fertilizers, and in the nearby failure to improve the breeds.[97] Before the war, artificial fertilizers were applied to only one percent of the crop land area on Java, although 13% (one million hectares) showed phosphate deficiency. Improved seeds were planted on only 25% of the total area. On the other hand, large-scale construction of a modern technical irrigation system and extension of the agricultural area by double cropping greatly enlarged the food production between 1900 and 1941. In this way the capacity of Java to support a larger population has been possible, as shown earlier.

In 1939 irrigated land accounted for 40% of total peasant agricultural land, and harvested areas amounted to 113% of total arable peasant agricultural land.

After the war, the government attempted to introduce fertilizers and improved seed on a large scale to meet the demand of the increasing population. At present about 75% of the rice fields is fertilized and about 50% of this is grown with improved seed; but because expedients have not been intensively or rightly applied, the success has not been up to expectation. In spite of a strenuous effort from the Agricultural Extension and the Irrigation Services to increase food production by extending the irrigated area at the same rate as the population increase, this has been only a partial success (see Chapter 9). In 1962 in Java the area of irrigated land was practically the same as before World War II and Java's harvested areas amounted to 120% of the total arable peasant agriculture land.

The production of paddy per hectare has more or less remained as before the war, namely 2180 kg before and 2350 kg after the war.[98]

Next, it was noticeable that the investment made in estates and peasant agriculture initially did raise the peasants' income. However, the rapidly growing population and the limitations of available resources for further improvements in the peasants' econmy, ultimately failed to raise the income of the Javanese farmers. Moreover, there occured no significant expansion outside traditional agricultural pursuits. Yet a rapid expansion was noticed within peasant agriculture which is made possible by the perfection of labour absorbing productive techniques which raise land, but not labour productivity.

[96] Due to the relative high food prices, as compared with other prices, the economic position of many farmers in Java and Madura who own land is better in the postwar than in the prewar period. But the position of the sharecroppers and the agricultural labourers is worse.

[97] The restricted use of fertilizers may be due to an unfavourable ratio between price and costs rather than the shortage of capital. Perhaps social factors that inhibit the use of fertilizers or other improved production practices also play a role.

[98] *Statistical pocketbook of Indonesia 1963*, p. 66.

Though there are still some possibilities left to raise agricultural productivity, as will be seen in Chapter 9, the central problem is that the rural population is increasing so rapidly, and that the exceptionally small farms are unable to absorb any additional labour force without a further decline in the already low level of living. The following chapters will illustrate the measures attempted by the government to face this problem.

6 Objectives of agricultural plans and policies

6.1 General background

The previous chapters have shown that the policies and actions of the government have a profound effect on the rate and direction of agricultural development. MOSHER has stated: "These policies and actions are of many kinds. The policies include those regarding landownership and tenancy, taxation, foreign exchange, tariffs, domestic prices and public investments. The actions include programs of education, research, credit, market regulation, land development, construction of transport facilities and many others as well. National planning is the process of deciding what the government is going to do with respect to each of those policies and actions affecting agricultural development within a given period of time. In making these decisions, the government must face up to the question of what is needed at the moment to move agriculture forward and what preparation needs to be made now in order to meet needs that can be foreseen in the near future. It must also take into account the amount and nature of its resources of money and manpower that can be applied to meeting the needs of agriculture."[99]

However, each government will formulate its own objectives since all do not desire the same things equally or in the same proportions. The priority given by each government to economic objectives will differ. These priorities, as reflected in the various agricultural development plans, express the governments attitudes, preference and principles. Therefore, first the general background of the objectives and policies of agricultural development in Indonesia will be given to show the government's attempt to increase the agricultural production. This background is also valid for Java.

This chapter primarily discusses agricultural development plans and therefore agricultural considerations play a decisive role. The author does feel the limitations of this presentation. If the reader wants to see Indonesian agricultural development in a broader context, as part of overall economic development plans, he should consult other studies and publications as well.[100]

As explained in Chapter 1, the government has to face the problems of large food imports, especially rice, and the declining importance of agricultural exports. There-

[99] A. T. MOSHER, *Getting agriculture moving*, New York, 1966, p. 169.

[100] For the convenience of the readers not familiar with the literature on economic development of Indonesia, a list is included in the bibliographic references.

fore, efforts have been made to replace the import of food and to promote the export of agricultural products, as appeared from the succesive agricultural development plans in Indonesia. These plans will be briefly discussed in the next sections.

6.2 The successive agricultural development plans

6.2.1. The Special Welfare Program

The first agricultural development plan after 1950 was launched in 1951, under the so-called 'Rentjana Kesedjahteraan Istimewa' (RKI), the Special Welfare Program.[101] In order to promote food production the government drew up plans arranged in two parts: a short-term plan, implying intensification of agriculture in Java, and a long-term plan implying intensification and extension of rice fields in the Outer Provincies. The available funds should serve to a more general use of better strains, to the extension of the application of fertilizers, to combat pests and diseases, to the improvement of irrigation, and to bring new rice fields into production.

This RKI is a combination of the so-called 'Kasimo Plan', which was launched by the Republic of Indonesia in Jogjakarta in 1948, during the revolution, and the 'Welfare Plan' of the Government of the Dutch East Indies, which was designed for the territories under their control. After the transfer of sovereignty by the Dutch government to the Republic of Indonesia in December 1949, the two plans were combined and called the RKI. The scope of the plan, the goals to be achieved and the amount of funds allocated were modest. The budget for this plan and the production targets for the various crops were fixed annually.

6.2.2. The Five Year Plan 1956–1960

The Five Year Development plan[102] 1956–1960 was prepared by the State Planning Bureau under the guidance of the then Minister of National Planning, Dr. DJUANDA. It included the twenty year projection of Indonesia's needs, population growth rates, source of financing and an agricultural development plan. The whole plan called for expenditures to a total amount of Rp 30,000 million. The agricultural part, also called the Second Agricultural Plan, primarily written by the Minister of Agriculture with the assistance of foreign experts and the author himself, should receive 13% of the total amount allocated for the execution.[103]

Actually this plan is a continuation of the RKI, but added are the non-food agri-

[101] *Rentjana kesedjahteraan istimewa*, Ministry of Agriculture, Djakarta, *1951–1955*.

[102] *Garis-garis besar rentjana pembangunan Lima Tahun 1956–1960*, Biro Perantjang Negara (State Planning Bureau), Djakarta, 1956 and 1957.

[103] In the meantime the 13% had been increased to 20% as a result of an amendment on the Five Year Plan where emphasis was put on food production and shipping.

cultural development projects like forest industries, the promotion of export products, etc. Development expenditures were not specifically earmarked for individual projects in the government budgets. The total expenditures in each category were approximately met in money terms, but the inflation caused much of the budgeted amounts to be absorbed in the ordinary government operating expenditures.

The quintupling of rice imports in 1955 to 1956, the decision to nationalize the remaining Dutch interests late in 1957 and the spreading rebellion in 1958 created major obstacles in carrying out this five-year plan; therefore it was adjusted to the then existing conditions. In 1957 major emphasis was put on the production of foodstuffs instead of the planned industrial projects.

In early 1958 as the Dutch 'Royal Packet Company' (KPM) withdrew its vessels, the government had also to pay much attention to maritime shipping.

6.2.3. The Three Years' Rice Program 1959–1962

During the execution of the Five Year plan, the Ministry of Agriculture launched its third agricultural development plan, which was better known under the name of 'Rentjana Swa Sembada Beras' (SBB, 'Selfsupporting in Domestic Rice Production Program'). This rice program was initiated in 1959 and aimed at selfsufficiency by the end of 1962.[104]

A more detailed account of the SSB will be given in Chapter 9.

6.2.4. The National Overall Development Plan 1961–1969

Before the Five Year plan was wholly executed, another plan was announced: the 'National Overall Development Plan 1961–1969'.[105] This eight year plan gives priority to projects designed to provide more autonomy to the local government and a more self-reliant economy. For the first three years emphasis should be put on food and clothing. The agricultural part (the fourth agricultural development plan since 1950), which was announced in August 1960, included the three years' rice plan (following the initiated plan of 1959) along with a number of other projects on food and fibre.

The general Overall Plan is divided into two parts:

A Projects, 335 in number (plus 39 provisional ones added later), are the core of the development program and are intended to contribute directly to national development. They consist of projects to increase domestic production for capital and consumption of both intangible and tangible forms.

B Projects, falling into 8 categories are projects which are hoped to provide additional

[104] *Rentjana Tiga Tahun produksi beras*, Departmen Pertanian (Ministry of Agriculture), Djakarta, 1960.

[105] *Ringkasan ketetapan madjelis permusjawaratan rakjat sementana, Republik Indonesia, No I dan II/MPRS/1960* (People's Consultative Congress), Djakarta, 1960.

rupiah and foreign exchange revenues sufficient to cover the cost of the A projects. It is primarily concentrated on the increase of agriculture exports (e.g. rubber, tea, coffee, copra, fish), mineral export (e.g. tin and oil) and tourism.[106]

The A projects contain twelve major groups which, together with their expected expenditures, are shown in Table 71.

The B projects, to be started at the same time as the A projects, comprise the planned expansion of agricultural and mineral export production. Other B projects are mainly increases of receipts from existing sources that are to be reserved for financing the Overall Development Plan. This plan aims at gross foreign exchange receipts of nearly $ 2500 million, equivalent to about 111,000 million rupiah at the official exchange rate in 1960 (1 US $=Rp 45) and gross rupiah receipts of 120,000 million rupiah, or a total equivalent to about 231,000 million rupiah. Table 72 shows these

Table 71. 'A-projects' in Eight Year Development Plan 1961–1969; money figures in thousand million rupiahs.[1]

Group of projects	Project number	Planned expenditures		Allocation of expenditures		
		amount	per cent. of total	local currency	foreign currency	not allocated
Cultural	9	1.6	0.6	1.6	–	–
Educational	43	16.3	6.8	16.3	–	–
Research	16	2.7	1.1	0.8	1.9	–
Public welfare	11	6.2	2.6	6.0	0.2	–
Government	6	3.6	1.5	3.6	–	–
Food	8	25.1	10.5	14.0	11.1	–
Clothing	7	28.9	12.0	14.2	14.7	–
Industry	81	52.0	21.7	28.2	23.8	–
Health	6	2.2	0.9	1.7	0.5	–
Transport and communications	144	60.2	25.1	36.2	24.0	–
motor transport*	11	30.9	12.9	23.9	7.1	–
rail transport*	1	7.0	2.9	3.0	4.0	–
sea transport*	4	10.1	4.2	3.2	6.9	–
air transport*	5	4.5	1.9	2.2	2.3	–
other communications*	4	7.7	3.2	4.0	3.7	–
Finance and Tourism	3	11.3	4.7	10.5	0.8	–
Special projects (military)	1	30.0	12.5	–	–	30.0
Total	335	240.0	100.0	133.0	77.0	30.0

* Not included in the 144 projects for transport and communications.
[1] Converted at the official exchange rate of 1 US $ = Rp 45.

Source: People's Consultative Congress and Ministry of Information as cited in: *Indonesia, perspectives and proposals for United States economic aid,* Report to the President of the USA Economic Survey Team to Indonesia, Washington DC, 1962.

[106] Fishing is included in the Department of Agriculture.

Table 72. Gross and net receipts on 'B Projects' and costs of 'A Projects' in Eight Year Development Plan 1961–1969.

	In foreign exchange in mill. $	in 1000 mill. Rp[1]	In 1000 mill. Rp	Total in 1000 mill. Rp[1]
Gross receipts from B projects	2,462.5	110.8	120.0	230.8
Expenditures for B projects	1,391.3[2]	62.6[2]	38.0[3]	100.6
Net receipts	1,071.2	48.2	82.0	130.2
Cost of A projects[4]	2,213.0	99.6	140.0	240.0
Net receipts from B projects	1,071.2	48.2	82.0	130.2
Financing not provided for	1,141.8	51.4	58.4	109.8

[1] US Dollars expressed in rupiahs at the official exchange rate of 1 $ = Rp 45.
[2] On the most unfavourable assumption of Rp 62,000 million cost of capital and consumer goods and the officially given 600 million rupiah foreign exchange cost of the tin projects.
[3] Includes 33,750 million rupiah for purchasing foreign exchange from oil companies and 4,230 million rupiah for reducing rubber and copra smuggling and for promoting tin and tourism projects.
[4] It is assumed here that 75% of the cost of the 'Special Projects' consist of foreign exchange cost, and 25% of rupiah cost (see Table 71).

Source: as in Table 71.

Table. 73. Expected receipts from 'B Projects' in Eight Year Development Plan 1961–1969.

	Foreign exchange revenue		Total revenue in 1000 mill. Rp
	in million US $	in 1000 mill. Rp[1]	
Oil:			
government share of exports	1,180	53.1	
foreign companies' capital in Rp	750	33.7	
Timber export increase	52.5	2.4	
Saving on fish import	12.5	0.6	
Copra export increase[2]	76	3.4	
Rubber export increase[2]	320	14.4	
Tin export increase	15	0.7	
Aluminium export increase	11.5	0.5	
Tourism	45	2.0	
Result of 1959 'monetary reform'			10
Share of state enterprise profits			32
Community saving			8
Sale of shares and bonds			8
Sale of capital goods			16
Sale of consumer goods			46
Total	2,462.5	110.8	120

[1] Converted at the official exchange rate of Rp 45 per US $.
[2] Through efforts to eliminate smuggling.

Source: as in Table 71.

sources more specifically. In the execution of the A projects, agriculture plays an important role as can be seen from this table. About 22.5% of the total investments is allocated for the execution of food and clothing projects which are primarily of agricultural origin.

In the implementation of the B projects, in order to earn additional foreign exchange for financing the A projects, about 20% is expected from agricultural sources as can be seen from Table 73.

6.3 Objectives and policies of agricultural development in Java

From what has been described in Chapters 3 to 5 it is obvious that the crucial problem of agricultural development in Indonesia is how to get agriculture moving in Java. If a solution could be found to Java's agricultural problems, agricultural development in the whole of Indonesia would be a relatively easy task. Thus the objectives of agricultural development as explained earlier, namely increasing food production and earning more foreign exchange, are of general importance. Therefore emphasis has been put on the following measures: (a) providing adequate food for the growing population, (b) assistance in earning or saving foreign exchange, (c) alleviating the population pressure on land primarily by transferring farmers to the less populated areas of the Outer Provinces. Other objectives are: (d) supplying raw materials for the growing industrial economy, (e) building up the economic and social overhead capital in the rural areas for a healthy and prosperous rural economy, and (f) reducing underemployment and increasing rural incomes through more intensive techniques.

As seen earlier in this study, Java's population increased from 50.5 million in 1950 to 64.6 in 1963, an increase of about 28% in a period of 12 years. The absolute magnitude of this increase (14.1 million) is superimposed on an already huge mass, while on the other hand the Outer Provinces are sparsely populated. Moreover, non-agricultural pursuits have not been able to absorb the net increase of population. Food production, especially that of rice, dominates the agricultural economy of this island, and it is becoming more and more difficult to feed the rapidly increasing population.

Before World War II, the sugar industry played a vital role in the Javanese economy. But after the economic crisis in 1933, and later because of the war and the revolution, these industries have not been able to regain their former position. Therefore, according to the government, there seem to be three main possibilities of investing capital in the Javanese agricultural economy, namely (a) the transfer of Javanese farmers to the sparsely populated Outer Islands, (b) to pay special attention to the rehabilitation of the sugar factories which are now mostly under state management, and (c) fertilization and, in association with it, the use of better seed and other improved agricultural techniques to increase the production of peasants' agriculture.

The government has attempted to exploit these possibilities to achieve its objectives. In the following Chapter it will be discussed in how far success was met with.

7 Agricultural resettlement

7.1 Organized agricultural resettlement in the Outer Provinces

7.1.1. Necessity and prewar development of agriculture resettlement

To gain a better insight into the scope of agricultural resettlement projects it may be helpful to start with a short description of land use and distribution of population in the whole of Indonesia.

In 1962 only 9% of the land area in Indonesia was regarded as arable as illustrated by Table 74.[107] But there is a striking difference between the intensity of land use in Java and Madura and the other major islands. Whereas 68% of the land in Java and Madura is divided into small farms or estates, in Borneo, the other extreme, only 1% is under regular agricultural use. In total, about 60% of the country is covered by forest, while 30% is urban, waste and unclassified land.

The last official census of Indonesia, in 1961, revealed that the total population amounted to 97,085 million.[108] With a land area of 1,904,345 square kilometers, this gives an average density of 51 persons per square kilometer.[109] This figure does not reflect the real problem of population density, because it does not take into account the extremely uneven distribution over the archipelago. The population of Java and Madura alone was 63,059 million in 1961, or nearly two thirds of the total; yet these islands make up only 7% of the land surface of Indonesia. The density of Java and Madura is 25 times the average density in the Outer Islands, as can be seen from Table 75.

There is a limit beyond which the cultivated area cannot be enlarged at the expense of the forest cover without serious consequences. This limit has already been passed on Java. Foresters have estimated that 30% of the land should be covered by forest to safeguard the water supply so vital to the sawahs of the island. Instead, forests now occupy only 22%. (see Table 74).

On the other hand, the Outer Islands have considerable possibilities for agricultural expansion, since much more land than necessary for the control of erosion is still

[107] The actual figure of the land under agriculture may be higher, as the conventional figure given by the Ministry of Agriculture for arable land amounts to 16 million ha instead of 13.7 million ha mentioned in Table 74. The difference can be explained by the inclusion of land devoted to shifting cultivation in the Ministry of Agriculture's figures.

[108] *Statistical pocketbook of Indonesia 1963*, p. 13.

[109] *Ibid.*

Table 74. Land use in Indonesia in 1962 (areas in million hectares).

Total	Agriculture						Forests		Not classified		Total area
	farms		estates		total						
	area	%	area	%	area	%	area	%	area	%	
Java, incl. Madura:											
West-Java	2.6	55	0.3	6	2.9	62	0.9	19	0.8	17	4.7
Central Java	2.6	73	0.1	3	2.8	76	0.7	19	0.3	8	3.7
East Java	3.0	62	0.2	4	3.2	67	1.3	27	0.3	6	4.8
Total	8.3	63	0.6	5	8.9	68	2.9	22	1.4	11	13.2
Sumatra:											
North Sumatra	0.7	6	0.9	7	1.6	13	8.4	67	2.6	21	12.6
Central Sumatra	0.6	4	0.1	0	0.7	4	12.6	66	5.6	30	18.9
South Sumatra	0.6	3	0.1	1	0.7	4	7.4	47	7.7	49	15.8
Total	1.9	4	1.1	2	3.0	6	28.4	60	15.9	34	47.4
Borneo	0.4	1	0.1	0	0.5	1	41.5	77	12.0	22	54.0
Celebes	1.2	6	0	0	1.2	6	9.9	52	7.8	41	18.9
Moluccas	0.1	1	0	0	0.1	1	6.0	72	2.3	27	8.4
Lesser Sunda Islands	0.5	7	0	0	0.5	7	1.4	19	5.4	74	7.3
Subtotal	11.9	8	1.8	1	13.7	9	90.2	60	44.7	30	149.2
West Irian		–	–	–	–	–	–	–	–	–	41.3
Total Indonesia											190.5

Source: Compiled from several publications as cited by J. N. A. MAHAN, *A survey to assess response to future consumption and desirable production of commercial fertilizers in Indonesia*, Djakarta 1962, p. 45 (mimeographed).

Table 75. Population density in Indonesia, 1961.

	Population in 1961 in millions	Area in square km	Density per square km
Java and Madura	63,059	132,174	477
Other islands	34,026	1,772,171	19
Indonesia	97,085	1,904,345	51

Source: *Statistical pocketbook of Indonesia 1963*, p. 13.

under forest. Nothing would seem more natural than an attempt to solve Java's problem of overpopulation with large-scale migration to the Outer Islands.

Transmigration has a history that goes back to the early part of the present century when the Netherlands East Indies' Government initiated organized resettlement to the Outer Islands. From 1905 to 1941, 204,000 persons moved from Java to the Outer Islands and 45,000 ha of new land were brought under cultivation. After some trial and error, the program was well under way just before World War II, when a temporary halt was put to this migration.[110] The present study will be restricted to the policies and achievements of the postwar period, and local transmigration will not be considered.[111]

7.1.2. Considerations on postwar transmigration

The postwar problems of transmigration are considered by the government to differ from those of the prewar period. The present transmigration or land settlement program should not be considered as the logical continuation of the plans of the former Netherlands East Indies' Government. The considerations leading to the present transmigration projects are the following:

(a) It is certainly true that the population problem of Java is yet to be solved, among other means, by transmigration. But at present, there are other considerations (to be mentioned below) of the government that make transmigration desirable. These considerations are perhaps even more important than moving surplus population. If, however, in the process some of the population pressure on Java is alleviated, this is all to the good. The other side of the coin is that solely transmigration is not sufficient to solve the problem of Java's overgrowing population.

(b) The Indonesian economy is almost entirely agricultural and in world trade it could do more than supply raw materials. On the import side, Indonesia still requires food and at the same time it also strives to import capital goods. The

[110] Sie Kwat Soen, *Land colonization in Indonesia*, Ithaca, 1957. (Unpublished M.Sc. thesis, available at the Cornell University Library).

[111] For readers interested in the pre-war achievements several excellent publications are available (see the bibliography at the end of this study).

extent to which such an economy is dependent on the vagaries of the international market is already known and does not need elaboration here. Planned diversification of the economy, also leading to further industrialization, is required to escape the nearly complete dependence on external market and sources of supply. But to all intents and purposes, in the initial stages industrialization will require imports of machinery and industrial equipment of all types. Since the government is of the opinion that increasing agricultural exports in the short run will be of doubtful value, it has attempted to raise the domestic production of basic foodstuffs for internal consumption in order to save foreign exchange. It is then to be hoped that a larger portion of imports could be devoted to capital goods.

As earlier explained, the program for increasing domestic food production can be accomplished by doing two things: by extending the land area and by intensifying the use of existing farm lands. As the possibilities to expand agricultural lands on Java have reached their limit, the extension of agricultural land should be accomplished in the Outer Provinces.

(c) After the war, defense considerations played an important role. The settlement of large numbers of young men, if possible with military training in such strategic locations as Borneo was considered very important.

(d) Furthermore the unitary state of Indonesia requires increasing assimilation of the Javanese and other ethnic groups in order to minimize the centrifugal political forces inherent in Indonesian nationalism. In other words, the government wants 'Indonesianization', the creation of a homogenous nation in which the problem of regionalism will gradually vanish.

7.1.3. Quantity and quality of land available in the Outer Islands

Although there is still much empty land outside Java which can be reclaimed for transmigration needs, for the time being and because of various difficulties, the government is devoting its main attention to open areas which have been sufficiently investigated. Even here, the projects are limited to the sections which offer the best possibilities and the reclamation of which can be most easily accomplished. The areas which are intended for transmigration centers amount according to the Ministry of Agriculture, to 2,542,000 ha, of which 695,000 ha of forest areas would be suitable for agriculture and 1,947,000 ha is proposed for forestry projects (Tables 76 and 77). Actually, the figure given by the Ministry of Agriculture is on the low side.

As has been said before, the Outer Islands have considerable possibilities for agricultural expansion, since much more land than necessary is covered by forest. There is a forest area of about 120,000,000 ha, including the forest reserve required for erosion control, distributed over the archipelago as can be seen in Table 78. But the situation is not as favourable as this table suggests. The forest area includes not only primary forest, but also an extensive area covered by alang-alang (*Imperata cylindrica*) and second growth forest.[112] Therefore, the author considers much more significant

Table 76. Forest areas in Indonesia considered suitable for agriculture in 1963.

Location	Province	Area (ha)	Remarks
West Pisang	Lampung (Sumatra)	20,000	Replacement of these
West Rumbia	Lampung (Sumatra)	40,000	forest areas in another
West Terusan	Lampung (Sumatra)	80,000	locality is desirable
South Mesudji, West Tulangbawang (Bedara nunggal)	Lampung (Sumatra)	100,000[1]	
South Mesudji, South Lumpur (Sungai Gebang)	Palembang (Sumatra)	80,000	
Rantaubinuang	Riau (Sumatra)	60,000	
Langsa	Atjeh (Sumatra)	30,000	
Bulaksana (Singkil)	Atjeh (Sumatra)	75,000	
Delta Kapuas (Pontianak)	West Borneo	80,000	
Sikau (Kumai)	Central Borneo	40,000	
Mamudji	South Celebes	90,000	
Total		695,000	

[1] It is expected that the Sanggarbuana Ltd. and the Tokyo Wood Working Industry will conduct logging operations in these areas.

Source: Department of Forestry, Ministry of Agriculture, *Contribution to the realization of the transmigration projects*, 1966, p. 10.

the figure given for available 'unoccupied' land by the State Planning Bureau. This refers to land which has already been investigated and found suitable for agricultural purposes, but not yet utilized. This land, 4,312,000 ha, scattered over the archipelago, represents more realistically the amount of land available for transmigration purposes in the next ten to twenty years; Table 79 supplies some details[113].

The quality of the soil must be taken into account in considering the available quantity of land. It should be kept in mind that the soil of Java for the greater part is unusually fertile for tropical regions, largely owing to its origin from volcanic ash of about neutral chemical reaction. Large areas in Sumatra, Borneo and Celebes are devoid of volcanoes and here some of the soils are strikingly poor. But this infertility is not an insurmountable obstacle, as modern agricultural technology can improve soil fertility by using fertilizers, growing leguminous plants, etc.

The amount and distribution of rainfall also greatly affects the fertility of tropical soils and hence population density. Heavy rainfall throughout the year combined with high temperature leaches the soil. Such rainfall in most parts of Sumatra, Borneo and some parts of Celebes, helps to account for the inferiority of their soils as com-

[112] If, due to the population pressure, fire repeatedly attacks abandoned temporary fields, finally only grasses and some herbs and shrubs survive. These persist because their roots, tubers or bulbs send out new shoots after the fire. The most important grass that finally triumphs over forest vegetation is *Imperata cylindrica*, called 'alang-alang' in Indonesia. (PELZER, *op. cit., fn.* 52, p. 19.).

[113] See also Table 80 for the area under cultivation in the Outer Islands.

Table 77. Proposed forestry projects.

Name and kind of projects L = logging, P = pulp	Area (ha)	Annual capacity (m^3)	Number of transmigrants	Required annual funds (US $)
Special projects to assist transmigration:				
Pulau Pini (North Sumatra), L	17,000	60,000	500	100,000
Sasak/Kinali (West Sumatra), L	60,000	120,000	1,000	200,000
Tapan (West Sumatra), L	30,000	120,000	1,000	200,000
Sunai Gaung (Riau), L	50,000	120,000	1,000	200,000
Sungai Buaja (Lampung), L	40,000	60,000	500	100,000
Meliau (West Borneo), L	80,000	120,000	1,000	200,000
Arut Kumai (Central Borneo), L	100,000	120,000	1,000	200,000
Palangkaraja I (Central Borneo), L	20,000	60,000	500	100,000
Mamudju (South Celebes), L	80,000	120,000	1,000	200,000
Other projects:				
Singkil (Atjeh)[1], L	60,000	120,000	1,000	100,000
Simalur (Atjeh)[1], L	40,000	120,000	1,000	100,000
Penjengat (Riau)[1], L	50,000	120,000	1,000	100,000
Way Hitam (South Sumatra)[1], L	30,000	60,000	500	50,000
Warsamson (West Irian), L	60,000	120,000	1,000	100,000
Manukwari (West Irian), L	120,000	120,000	1,000	100,000
Nabiro (West Irian), L	80,000	120,000	1,000	100,000
Sarmi (West Irian), L	120,000	120,000	1,000	100,000
Nunukan (East Borneo)[2], L	18,000	80,000	200	150,000
Sesajap (East Borneo)[2], L	18,000	80,000	200	150,000
Malinau (East Borneo)[2], L	18,000	80,000	200	300,000
Pulau Laut (South Borneo), L	20,000	80,000	200	150,000
Sampit (Central Borneo)[2], L	20,000	80,000	200	150,000
Takengon (Atjeh)[1], L	80,000	270,000	1,300	–
Siondop (North Sumatra)[1], L	50,000	166,000	850	–
Torgamba (North Sumatra)[1], L	50,000	100,000	500	–
Mursala (North Sumatra)[1], L	6,000	30,000	150	–
Batahan (North Sumatra)[1], L	14,000	30,000	150	–
Mentawai (West Sumatra)[1], L	30,000	33,400	150	–
Bukit Gadang (West Sumatra)[1], L	60,000	100,000	500	–
Mandau (Riau)[1], L	40,000	107,000	500	–
Rangau (West Sumatra)[1], L	20,000	40,000	150	–
Sengati Kahidupan (Djambi)[1], L	30,000	70,000	400	–
Semangus (South Sumatra)[1], L	70,000	120,000	600	–
Rawos (South Sumatra)[1], L	31,000	82,700	400	–
Sokosuban (South Sumatra)[1], L	30,000	40,000	150	–
Sampit (Central Borneo), P	40,000	5,000[3]	100	–
Samarinda (East Borneo), P	40,000	5,000[3]	100	–
Batulitjin (South Borneo), L	25,000	80,000	200	–
Palankaraja II (Central Borneo), L	60,000	100,000	500	–
Palangkaraja III (Central Borneo), L	60,000	100,000	500	–
Obi (Moluccas), L	40,000	80,000	400	–
Buru (Moluccas), L	40,000	80,000	400	–
Total	1,947,000		24,000	3,200,000

[1] Trans Sumatra Highway forestry projects. [2] Projects in operation. [3] In tons.

Note: The contribution can be increased if wood industries can be integrated in the logging projects.

Source: Department of Forestry, Ministry of Agriculture, *Contribution to the realization of the transmigration projects*, 1966, pp. 11–12.

pared with those of Java, where especially in the middle and eastern provinces the rainfall is concentrated in the west monsoon. Obviously much research work still must be done to find just how to manage the poor tropical soils.

Still a further consideration is the accessibility of the areas to markets. Much of the area of the Outer Islands is hidden behind mountains or jungles. The cost of opening transportation facilities would be tremendous. This is a limitation which can only be overcome slowly.

Table 78. Forest area in Indonesia, in 1000 ha (1966).

	Cultivated or under regular supervision	Without fixed purpose	Total
Java and Madura	2,990.8	–	2,990.8
Sumatra	7,793.2	20,626.8	28,420.0
Borneo	3,908.4	37,561.6	41,470.0
Celebes	1,689.2	8,220.8	9,910.0
Moluccas and West Irian	–	37,500.0	37,500.0
Lesser Sunda Islands	1,218.2	265.6	1,483.8
Indonesia	18,000	105,000	120,000

The difference of about 6,000,000 ha in the totals is caused by the fact that in Dr. MAHAN's figures in Table 74 some of the forest areas are included in the non-classified land.
Source: Ministry of Agriculture, Department of Forestry: *Forest resources in Indonesia*, 1966, p. 5.

Table 79. Available unoccupied land in the Outer Islands, in hectares (1954).

North Sumatra	Central Sumatra	South Sumatra	Borneo	Celebes	Moluccas	Lesser Sunda Islands	Total
607,000	1,030,000	776,000	799,000	687,000	150,000	263,000	4,312,000

Source: State Planning Bureau, *Questionnaire for Indonesia, M/700/XII/54–30*, 1954.

Table 80. Cultivated area of smallholders' agriculture in the Outer Islands, Indonesia, 1954 (in ha).

	Lowland rice	Dry fields	Shifting cultivation		Permanent perennial crops	Total
			upland rice	perennial crops		
North Sumatra	254,500	249,100	130,400	17,400	288,300	939,700
Central Sumatra	241,800	222,600	142,000	28,100	783,800	1,418,300
South Sumatra	124,200	266,900	197,500	42,900	398,500	1,030,000
Borneo	196,600	–	244,000	–	393,500	833,300
Celebes	–	47,500	45,500	–	47,500	140,500
Lesser Sunda Islands	248,300	252,200	–	16,000	62,900	579,400
Total	1,493,400	1,673,800	855,800	107,200	2,368,300	6,498,500

Source: See Table 79.

7.1.4. Administrative organization of transmigration

According to Government Regulation No. 2 of 1952, the plans for resettlement shall be drawn up by the Director of the State Planning Bureau.[114] In order to coordinate the migration program a Committee of Transmigration was established in 1955. The members consist of representatives of various Ministries (with the Vice Premier as chairman), the National Reconstruction Bureau (Biro Rekonstruksi Nasional, BRN and the National Reserve Corps (Corps Tjadangan Nasional, CTN).[115] The author served in the capacity of secretary from 1953 to 1955. This Coordination Committee is responsible for handling the work of the various ministries and agencies.

Since 1959 this Committee has been reorganized several times. Sometimes it is called Board of Transmigration and, apart from changes in persons, its composition remained more or less the same.

The government's organized program for internal migration, or transmigration, is under responsibility of three agencies. Two of them devote their time to the settlement of veterans of the revolution and the army, while the third deals with the other population groups.

The CTN was established to handle ex-members of the regular Indonesian army. It was subsequently reorganized into the BPBAT (Biro Penampungan Bekas Anggauta Tentara or Resettlement Bureau for Ex-service Men).

The BRN was organized to resettle former guerilla fighters, people who were active during the revolution as 'irregulars'. Finally, the Department of Transmigration dealt with the resettlement in the more traditional sense.

The BPBAT and the BRN are provisional organizations to be disbanded as soon as the rehabilitation of ex-fighters and reservists is completed. The Department of Transmigration is recognized as a permanent organization[116]; its responsibilities are as follows: (a) In the assembly area (Java): registration of the candidates for resettlement, collection and transport, and subsidizing during collection and transport; (b) In the resettlement area: investigation, survey, opening and distribution of the land, together with reception, location and care of migrants, and provision for the welfare of the migrants, beginning with the formation and centralization of an economic and social organization to be channeled into a village-city form of society.

7.1.5. Selection of settlers

The 'ten commandments of MAASSEN', the guiding rules for selecting settlers for the regular transmigration as described in the following pages are still applied by the Department of Transmigration.[117] They are:

[114] BACHTIAR AMINUDDIN, Theory and practice in the problem of resettlement. *Siasat 8*, (January 1954), p. 1.

[115] Jajasan Pembukaan Tanah Transmigrasi, Institute for Opening of Settlement Lands. The chairman is always chosen from the Ministry of Social Affairs.

(1) Select genuine farmers; non-farmers are a burden for a settlement and endanger its success.
(2) Select physically strong people; only they can stand the hardships of pioneering.
(3) Select young people; by taking them, one reduces future population increase on Java.
(4) Select families; families are the foundation of peace and order in the settlement.
(5) Don't select families with many young children; the working members of the family cannot carry that burden at the start.
(6) Don't select former plantation labourers; in 90% of the cases they are cause of discontent in the settlement.
(7) Don't allow so-called 'resettlement marriage'; they are a source of unrest in settlement.[118]
(8) Don't accept expectant mothers; the pioneer settler needs the full help of the wife during the first years.
(9) Don't accept bachelors; sooner or later they will become involved with somebody else's wife.
(10) Allow dessas or kampongs to migrate as a whole; in such cases the first nine commandments may be ignored.

7.1.6. Kinds of transmigration

One of the 'faults' in the resettlement scheme as it operated just before the war, was the preference given to families, thus ignoring the fact that the village, as well as the family, is a basic social unit among the Javanese.

The Indonesian government has noticed the weakness of former resettlement plans and tried to correct them in its new transmigration scheme. Large-scale migrations are now contemplated, based on colonization by integrated village units, including, wherever possible, the head of the village and the religious elders. But such a group colonization will not facilitate the dispersion of migrants among the autochthonous population, thus slowing down the 'Indonesianization process'.

In 1956 the government planned to carry out an interesting project which was called 'Transmigrasi intellectueel' (the transmigration of intellectuals). 'Intellectual' is broadly defined to include not only persons with high school and more advanced education, but also those with skills, such as carpenters, blacksmiths, etc. Such migrants are intended to form new, non-agricultural villages. But it is stressed that it is not the purpose of the government to create a special class in these transmigration

[116] It was successively put under several ministries since its establishment in 1950, first under the Ministry of Social Affairs, then under the Ministry of Transmigration, Cooperatives and Community Development.

[117] PELZER, *op. cit.* (*fn.* 52), p. 210.

[118] "Frequently bachelors marry hastely before emigrating in order to be acceptable. Their wives are known as 'voyage wives' (bini djalan) or 'tow wives' (bini gandingan)" (PELZER, *op. cit.*, *fn.* 52, p. 210).

areas.[119] Future transmigration policy may be significantly affected by comparing the achievements of transmigration of intellectuals with the transmigration of farmers.

In 1955, there was also a plan to move students with agricultural high-school training to Central Sumatra. Their allotment of land was to be 10 to 15 ha and it was intended that they would apply mechanization to rice cultivation on dry land.[120] But it is doubtful whether this form of agriculture will be feasible in Indonesia; experience in the past has not been encouraging. Further information on the execution of this project is not available.

The standard colonists' allotment consists of two hectares of land. Irrigation is provided for, the land is cleared and contoured, a house is built and roads are established. Travelling expenses to the site are furnished and a subsistence allowance is granted until the first harvest. Seeds, tools and financial aid are given for rising the rice crop. Besides these facilities, the migration areas are provided with medical clinics, schools and other social overhead capital.

According to plans of the Department of Transmigration, two million people or 400,000 families will be moved to the following islands during the eight years' period beginning in 1961[121]:

Sumatra	640,000	persons	(32 %)
Borneo	1,040,000	„	(52 %)
Celebes	89,000	„	(4.5%)
Moluccas and West Irian	230,000	„	(11.5%)
Lesser Sunda Islands (excluding Lombok)	1,000	„	(0 %)

The policy of the Department of Transmigration is to direct its activities towards the following subjects[122]:

(a) Placing settlers in already well-established areas, where there is still room for more settlers.
(b) Carrying forward projects which are not finished, i.e. in regions now only partly occupied by resettlers.
(c) Opening new settlements adjacent to progressive resettlers.

The formation of a new isolated settlement requires previous detailed investigations as transmigration is justified only when all possibilities have been studied intensively enough to guarantee a healthy growth later on.[123]

By confining transmigration to already established areas, the seeds, etc., which the settlers need, can be more easily provided. If, at times, a shortage of food occurs from pests or diseases, the settlers may expect help from neighbours. A shortage of labour also can be met in this way. For example, seasonal labour shortage may appear during the period when soil is prepared or during harvesting while irregular labour demand

[119] *Rentjana penjelenggaraan transmigrasi 1956*, p. 6.
[120] Opinion expressed verbally by JAHJA, former head of the Institute of Soil Research, Bogor.
[121] Department of Forestry, Djakarta, *Contribution to the realisation of the transmigration projects*, 1966, p. 2.
[122] KAMSAH, Transmigration, *Madjalah berkala pertanian 9*, 1953.
[123] *Ibid.*, p. 2.

may arise during the construction and repair of roads, dams and water channels.

A new settlement isolated in the middle of the rain forest often suffers from plant pests.

Settlements should be located as much as possible near transport facilities, or there must, at least, be a possibility of creating a transportation network in the future.

The size of new resettlements must be adequate for efficient operation.[124] Experience has shown clearly that tiny colonies are difficult to keep alive.

7.1.7. Economic organization of the settlement area

Before World War II, 1.05 ha of sawah in new settlements was thought to guarantee a proper subsistence for a family. The governement provided 2 ha to each family and presented a proposal to enlarge it to 3 ha.[125] According to KEYFITZ and WIDJOJO, the settlers indeed got 1.4 ha, being 1.05 ha arable land and 0.35 ha for a house and surrounding gardens.[126] This gives a total of 1.4 ha, while later on TAMBUNAN mentions in the Work Plan for 1951 an increase in the allotment of workable land to 2 ha per family.[127]

Land is allocated in accordance with the Department of Transmigration Regulation no. 3 of 1953, article 6, which provides that every migrant family in the area shall be given land by the government as follows:

(a) For the non-farmer a plot of land at least 0.25 ha in size for his house.
(b) For the farmer, a plot of land 0.25 ha for a house and at least 1.75 ha for work land.
(c) The farmer-migrant shall have cultivation rights on the afore said work land for three years.
(d) If, according to an examination by the Department of Transmigration the above mentioned workable land has been cultivated as well as possible, the rights of cultivation shall be changed to a right of ownership.
(e) The non-farmer who later wants to farm also can be given work land in the same manner as for the farmers'.[128]

The problem of determining the size of land holdings to be allocated to migrants is not only related to considerations of land and labour, but involves capital requirements, especially if expenditure for clearing the forest, building the roads, etc. are necessary prior to settling.

The determination of an optimum size of holding on this basis therefore resolves

[124] *Ibid.*, p. 3.
[125] *Ibid.*, p. 2.
[126] N. KEYFITZ and WIDJOJO, *Soal penduduk dan pembangunan Indonesia*, Djakarta 1955, p. 127.
[127] TAMBUNAN, The resettlement problem work plan for 1951, *Penerangan Daerah*, April 1951, p. 14. In addition to this 2 ha, 0.50 ha is calculated for roads and public buildings (see: Department of Forestry, *op. cit.* (*fn.* 121), p. 2.
[128] AMINUDDIN, *op. cit.* (*fn.* 114).

itself into the problem of estimating optimum production factor proportions. If land and capital are available in abundance, then there is no problem. But in Indonesia, with its shortage of capital, transmigration must compete with alternative uses such as agricultural techniques and mechanization. Moreover, with respect to size of holdings, economic factors need not dominate. The government also has to face political difficulties, and it has to avoid giving the impression of favouring the Javanese farmers at the expense of the autochthonous population. A solution might be found by stipulating that, wherever migrants from seriously overpopulated areas of Java are recruited for agricultural colonies in the Outer Islands, every province of Indonesia has the right to be represented in the settlement project of the government.

The first method, moving people from Java to the Outer Islands, is probably more efficient in relieving pressure in locations where this relief is mostly needed. The second method sacrifices part of the efficiency for the broader objectives of giving citizens, from all parts of Indonesia, the right to share in a national undertaking. At the same time it achieves the goal of breaking down provincialism and promoting national solidarity by bringing together as many divergent groups as possible.

It is not practicable to leave the clearing of the forest entirely to the settlers[129], because such work, on say two hectares, is far too heavy for one family, especially when the vegetation is entirely jungle (which is normal). If the clearing work has to be finished quickly, it should be carried out by machinery or, if this is not possible, the job should be given on contract to local inhabitants who really understand such work.

The land which has been cleared must be planted as soon as possible. If planting is not promptly done, the already mentioned alang-alang will quickly cover the cleared area. Once this has happened, the cost of reclamation is prohibitive. Such grass plains serve solely as hunting reserves.

For this reason, the transport of prospective settlers should be timed to match exactly the progress in opening the forest land of the new colony. To secure efficient clearing of forest land, the government has formed the 'Jajasan Pembukaan Tanah Transmigrasi' (Japeta), the Institute for the Opening of Settlement Land, which closely cooperates with the Department of Transmigration. Moreover, the Japeta has a representative on the Coordination Committee of Transmigration. Except for the one year, when it was included in the Department of Transmigration, this institution received a seperate budget appropriation.

The basic administrative area for transmigration is the resettlement district.[130] Such a district will have an area of at least 12,000 ha and it will be supplied with whatever equipment is considered necessary. Resettlement districts will be organized by the Department of Transmigration and Japeta with the aid of other agencies (Public works, Irrigation, Internal Affairs, Finance, Economic Affairs, Labour, Agriculture, etc.).

Among the regions which are proposed for settlements the Sukadana Complex

[129] KAMSAH, *op. cit.* (*fn.* 122), p. 4.
[130] *Ibid.*, p. 5.

(Lampung, Sumatra) is considered particularly suitable. Including roads etc. about 140,000 ha of forest land and old secondary growth will gradually be transformed into ten districts.[131]

Each district will be supplied with:

(a) A 'mother village' for the Pamong Pradja (Civil Service) and other authorities, small scale industry, trade, etc. (100 ha).
(b) A seed farm for paddy, secondary crops, fruits, commercial plants, etc. (50 ha).
(c) A stock breeding center (100 ha).
(d) Forest to the extent of 500 ha.
(e) Farm land for about 4000 families (12,000 ha).[132]

The pattern of agriculture is determined primarily by three purposes: food for the family, fodder for the livestock (chiefly draught animals) and products for sale. The small size of the productive unit results in emphasis on the first two needs.

The structure of the agricultural labour economy is based on the dominance of the peasant family unit. This means that the majority of productive units in most transmigration regions do not offer employment to outside labour, except at times when pressure of seasonal operations makes such employment unavoidable.[133]

Although 2 ha of land are given to each settler, this does not necessarily improve his economic status as compared with that in Java (0.85 ha in the early fifties)[134], because as a rule the land in Java is more fertile. Thus, the policy of the government does not raise the farmer in the settlement areas materially above the level of subsistence.

According to the Department of Transmigration[135], the average *per catita* income in the colonization areas in 1954 was between Rp 2.70 and Rp 3.60 a day. In Jogjakarta (Central Java) the agricultural labourer had at that time a *per capita* income of Rp 0.78 a day, while a farmer with land had Rp 3.91; the latter figure is explained by the fact that better irrigation facilities made double cropping possible. But if the settler comes from the class of agricultural labourers, his economic situation is substantially improved.

Another aspect of the level of living of the settler which must be touched upon is food consumption. The average diet of the settler is favourable as compared with that in Java, qualitatively as well as quantitatively. But the level of food consumption and nutrition in the colonization areas can still be improved, especially with food rich in protein (pulses, meat, fish, etc.).

[131] *Ibid.*

[132] The Department of Transmigration is in favour of giving a colonization family 3 ha instead of 2 ha as earlier mentioned. It is divided as follows: 2 ha to produce padi and second crops, 0.25 for house and surrounding garden and 0.75 ha for commercial crops like rubber, coffee, etc. But this allotment of 3 ha had not been approved by the cabinet.

[133] See Chapter 5.

[134] *Penjelenggaraan transmigrasi 1954*, Djakarta, 1955, p. 6.

[135] *Ibid.*

7.1.8. Obstacles to transmigration

For the economic development of a resettlement area, a certain amount of acculturation or assimilation of the new inhabitants is necessary. Therefore, no Javanese agricultural settlement could be founded without the collaboration of the basic population unit of the community in the Outer Islands.[136]

Till now, the local community officials have shown themselves anxious to support Javanese settlement, probably because of the financial advantages connected with it. But it is doubtful if this attitude will persist indefinitely. The recent regional military revolts have indicated that the people of the Outer Islands seem to be 'restless' under the Java-oriented national government in Djakarta. Therefore it is the task of the present government to create an atmosphere in which transmigration is considered by all ethnic groups as a necessary national adventure, a national objective. All groups must understand that all Indonesians must have a stake in the success of transmigration. Education, extension work, and the press can contribute to make this agricultural resettlement an integral part of the economic development of the whole country.

The national government has to be tactful in carrying out these resettlement programs. The impression must not be created that the Javansee farmer will benefit at the expense of the autochthonous population in the Outer Islands.

The social relationship between the autochthonous population and the settlers is another field where successful policies and techniques remain to be developed. As already mentioned earlier, the government's intention is that assimilation between the newcomers and the original inhabitants shall take place as soon as possible. In other words, the objective is Indonesianization, the creation of a homogenous nation and the reduction of regionalism to the point where it is no longer a threat to national existence.[137]

In the resettlement area, however, this problem of regionalism becomes complicated. According to BACHTIAR AMINUDDIN, the reasons are the 'mistakes' sometimes made in the newly built villages in the neighbourhood of the pioneer village: each new group tends to become isolated in its settlement. Even now, the relation between newcomers and oldtimers leaves much to be desired.

Other causes can be found in the mistakes made on both sides, especially in the Lampung area.[138]

First, it can be said that the Lampung people look down on the newcomers. This is because they are generally well-to-do as compared with the newcomers, who represent the 'have nots'. Intermarriage is difficult, because in addition to isolating themselves from one another:

[136] For example 'ulajat land' in Minangkabau (Central Sumatra), 'patuan land' in Ambon (Moluccas), and 'marga land' in Lampung. See AMINUDDIN, *op. cit.* (*fn.* 114).

[137] B. AMINUDDIN, Resettlement *is not the only way of solving problems of population density*, *Siasat 8*, Jan. 1954, p. 1.

[138] *Ibid.*

(a) The bride money required by the Lampung people tends to make it too expensive to propose to a Lampung girl.
(b) The Javanese are not allowed to visit the courting place (a place of *rendez-vous* for the Lampung youth).
(c) The Lampung people seldom visit the market place of the Javanese or their cultural performances.

On the other hand, the newcomers make no effort to study the local language which is an important tool for mutual understanding. The Javanese language is quite general in Lampung and quite a number of the local people can communicate in Javanese.[139] Moreover, the names of the villages established by the newcomers are taken from their place of origin. Thus we see these new villages with names like Wonosobo, Wonogiri, Brebes, Purbolinggo and Wates taken from places existing in Java.

BACHTIAR AMINUDDIN suggests that assimilation of the Javanese and the residents of the Lampung may be accelerated by the following[140]:
(a) The establishment of political parties in the area.
(b) The establishment of social clubs, labour and farmers unions, women's activities, neighbourhood associations, religious groups and so forth.
(c) The organization of sport, youth groups and so forth.
(d) The establishment of schools with the Indonesian language as the medium of instruction.
(e) The establishment of buildings for public meetings.
(f) The organization of an assimilated civil service.
(g) The mixing of migrants from the same village among the local inhabitants instead of keeping them separate.
(h) The entrance of the migrants into the marga (local community) and, more or less as a consequence, the rights to join landownership.

Up to 1960 there was no comprehensive law or regulation in Indonesia concerning land, and the problem of land tenure was regionally regulated. Adat (custom) played a predominating role in all decisions in this field. Among others, various district lands, controlled by the marga, could not be 'disturbed' by people from outside that marga.[141] Thus an important factor in this transmigration scheme is the question of ownership of and control over the land and whether the owner is willing to accept Javanese settlers. The securing of suitable land offers a complex problem since much of the area of the Outer Islands has been occupied permanently or temporarily by the indigenous people. Large parts of these areas are not actually used for agriculture, but are needed as gathering grounds for such forest products as rattan, resins and lumber,

[139] *Ibid.*, p. 2.
[140] *Ibid.*
[141] In southern Sumatra, the highest indigenous political unit in each district is the marga, which comprises a number of villages (PELZER, *op. cit., fn.* 52, p. 207); for a discussion of the margas in southern Sumatra, PELZER mentions VAN DER ZWAAL, *Inlandsch gemeentewezen in Zuid-Sumatra en Javanen-transmigratie*, Wageningen, 1936.

and as hunting grounds. No person, unless belonging to the community that claims territorial sovereignity over such land, may use it without the consent of the community. Such permission may usually be secured by the payment of a nominal fee. Therefore an up-to-date agrarian law for the Outer Island was needed to establish suitable tenure rights for the settlers and to ensure the collaboration of the indigenous population in the transmigration program.

In 1960 the government enacted the Basic Agrarian Law no. 5 which concerns the basic principles of agrarian regulations. It settles the various landrights, the tenancy and rent arrangements, the limits of landownership, etc. Furthermore it is stated in this law that lands not belonging to individuals or public bodies, including the so-called 'marga-land' in Sumatra and similar holdings in other parts of the Outer Provinces are owned by the state.

The government can 'enforce' the establishment of agricultural land resettlement projects in certain areas even against the objection of the local community concerned. Formerly this was impossible, because it had no right to dictate plans to the marga. Of course, the government always tries to make the utmost efforts in coming to an agreement with the community before starting the executing of its plans.

On the other hand, the government should administer the new legislation with much caution so as to avoid giving the impression to the indigenous population of the Outer Islands that their traditional rights are being pushed in order to favour the Javanese farmers.

Land which is not included in some marga is usually located in areas where there are no human beings, and there the establishment of new settlements is particularly difficult. The solution here will be to construct roads between such areas and the outside world. But the important point is how to select pioneers who are willing to face loneliness in these extensive jungles.

Generally it is accepted that the social ties in the traditional village community and the attachment to the soil are the main reasons which prevent the farmer from leaving his village. The Department of Transmigration has made intensive propaganda efforts to reduce the reluctance of the Javanese to migrate. It was reported that in 1954 approximately 2,000,000 persons registered to be moved to the Outer Islands. But, due to lack of funds, only a small part of them could be actually transferred.[142]

New ways have to be found to reduce the government's cost. This point will be covered later in this study where spontaneous colonization after the war will be discussed.

Until now, the government has held the belief that the possibilities of irrigation in the new areas are especially important. The social prestige of the Javanese is based on the ownership of sawahs (wet rice field) and it is less difficult to persuade him to migrate to a wet growing region than to a region where he could never expect to establish sawah.

But irrigation has its limits. Sooner or later a shift to dry field agriculture will be

[142] The government has to pay all expenses.

necessary. Although the main feature of the postwar period in Indonesia has been the slow recovery of the prewar food consumption level, there is evidence suggesting that with the growth of the towns, the increasing industrialization and the gradual rise in national income, there may be a marked trend towards a more 'western' type of diet.

This involves an increase in demand for such articles as oils, fats, fruits, vegetables and livestock products. This way, ultimately, also leads to a surplus in the production of rice. For this reason, the Agricultural Extension Service is encouraging the so-called 'compound cultivation', i.e. planting of vegetables, fruit trees, tuberous plants and other crops on dry fields.

Some efforts are also being made to integrate the development of crops with an expanded production of livestock. In this way animal residues are returned to the soil and will increase its fertility. This mixed crop-livestock agriculture is a promising line of development in Indonesian agriculture.

Another possibility in dry field agriculture is the cultivation of export crops. But such a program is subject to important reservations. In particular, attractive prices of agricultural export products as compared with other crops, are certainly needed to encourage the farmers to plant those crops.

Transportation is another limiting factor in carrying out the migration program on a large scale as shipping tonnage is scarce in Indonesia and shipping is essential since the country consists of many islands.

However, the government's program can be carried out only over a long period owing to the weak state of public finance. But if the Department of Transmigration wants to speed up the rate of migration, it must find, among other things, a way to reduce the shipping shortage e.g., by chartering foreign ships.

7.1.9. Cost of resettlement

There are no accurate figures available on the costs of moving one family.

In 1966, the Department of Forestry gave the following data.[143]

(a) *Land and land clearing.* Each family consisting of 5 persons needs on the average 2.5 ha of land: 1 ha for food crops, 0.75 ha for other crops, 0.25 ha for housing and gardening and 0.50 ha for roads and buildings. Of this 2.5 ha only 1 ha would be cleared by the government, while the rest can be done later on by transmigrants themselves. This 1 ha is intended for housing, gardening, roads and buildings, so that 0.25 ha remains for food crops. The clearing of land, which amounts to 400,000 ha annually, has to be done mechanically. The necessary surveys would cost Rp 50/ha, Rp 250 has to be paid to free one hectare from ownership rights. Expenses for clearing are estimated on $ 60+Rp 350/ha.

(b) *Housing and other buildings.* Each family is provided with a locally made pre-

[143] Ministry of Agriculture, Department of Forestry, *Contribution to the realization of the transmigration projects*, May 1966, pp. 2–3.

fabricated house of 36 m^2 and 4 m^2 for other buildings (schools, mosques, etc.). Total expenses: $ 52+Rp 6072 per family.

(c) *Agricultural seeds and tools.* Each farmer needs some tools, 50 kg of fertilizers, 7 kg paddy and 7 kg maize, which will cost Rp 250 per family.

(d) *Provision for the first 8 months.* Monthly each family needs 40.5 kg rice, 1 kg salt, 1 liter kerosene and 1 kg dried fish, together Rp 2880 for 8 months. Cooking utensils will cost Rp 75 per family, clothing Rp 250 per family. Total expenses per family for the first 8 months: Rp 3205.

(e) *Social welfare.* For the first 5 months social care will cost Rp 1250 per family.

(f) *Total cost per person:* Rp 2375+$ 22.50.

A better estimate is the figure based on the author's study published in 1957. It starts from the three cost figures given by the Department of Transmigration, namely the expenditures of the Department of Transmigration, the budget of that Department and the amounts received per family of average size of 4.5 persons. The trend in the cost of moving people by the Department of Transmigration is given in Tables 81 and 82.

The expenditures in 1954 were about seventeen times as high as those in 1951, but the number of resettled persons rose only to its tenfold. Thus the rupiah cost per family increased.

In examining the budget figures of the Department of Transmigration a continuous increase until 1953 is observed, then a drop occurs in 1954 and 1955 and they rise again in 1956. The increase of the total amount received per family from 1951–1954 also indicates the increase in the total cost of moving. To this figure still have to be added expenditures for irrigation, road building, health and educational purposes.

The cost of irrigation will account for a substantial part. S. K. DEY, UN Consultant on Community Development to the government of Indonesia, estimated it in 1955 at Rp 3000 per hectare.[144]

Table 81. Budget amounts and expenditures of the Department of Transmigration, in million rupiahs, 1950–1956.

	1950	1951	1952	1953	1954	1955	1956
Budget amounts	5	3.5	17.5[1]	57.7	54.1	47.0	84.0
Actual expenditures	–	3.0	1.3[2]	45.3	50.4	–	–

[1] Exclusive payroll of personnel.

[2] The great difference between the figures for 1952 is caused by the fact that the expenditures for the JAPETA (Jajasan Pembukaun Tanah Transmigrasi, the Institute for the Opening of Settlement Lands) were included in the budget of the Department of Transmigration.

Sources: Department of Transmigration, *Penjelenggaraan transmigrasi 1954*, p. 4 (for the years 1955 to 1954, and: *ibid.* 1956, p. 4 for the years 1955 and 1956).

[144] State Planning Bureau (S. K. DEY, *Gotong royong or alang-alang*, Djakarta, 1955, p. 53).

Table 82. Amounts received and cost of moving per migration family, 1951–1954.

	Number of migrants	Amounts received per family in Rps	Cost of moving one family	
			actual cost in Rps[1]	rupiah costs[2] in 1938
1951	2,541	4,304	8,600	230
1952	16,825	5,054	10,100	279
1953	35,432	5,191	10,400	326
1954	26,239	6,242	12,500	408

[1] N. KEYFITZ and WIDJOJO, *op. cit.* (fn. 126), p. 127. The actual cost of moving is roughly twice the amount per family. This approximation has generally been accepted as a rule of thumb.
[2] Obtained by dividing each figure in the preceding column by the corresponding index for the cost of living (see Table 83).

Source: Department of Transmigration, *Penjelenggaraan transmigrasi 1954*, pp. 4–6.

Table 83. Weighed index numbers of market prices of twelve foodstuffs in the countryside of Java, 1950–1954 (1938 = 100).

1950	1951	1952	1953	1954
1591	3188	3620	3166	3063

Source: Central Bureau of Statistics, *Statistical Abstracts 1956*, p. 70.

Table 84. Specification of the amount received per migrant family of 4.5 persons 1951–1954.

	1951 in Rps	1952 in Rps	1953 in Rps	1954	
				in Rps	% of total amount
Household	89	90	40	70[2]	1.1
Clothing	114	121	91	55[2]	0.9
Agricultural equipment	31	33	50	60[2]	1.0
Seeds	70	40	60	107	1.8
Housing costs	2100	2000	2000	2500	40.2
Living expenses for 10 months	950	1250	1450	1600	25.2
Transportation	450	500	550	600[3]	9.7
Clearing 1 ha of land	500	750	750	1000	16.1
Cost of temporary quarters[1]	–	250	250	250	4.0
Total	4304	5054	5191	6242	100.0

[1] If the migrants have to wait for the distribution of houses.
[2] The quantity of goods was lower than in 1951 and 1952.
[3] The transportation costs amounted to Rp 600, whereas under 7.1.9. they were mentioned to be Rp 492. The difference is probably explained by the inclusions in the first figure, of board and lodging during travel.

Source: Department of Transmigration, *Penjelenggaraan transmigrasi 1954*, Djakarta 1954, p. 4.

Table 85. Indebtedness of migrants to the government, 1950–1953 (in rupiahs).

	Kind of migration scheme	Number of migrated families	Amount of debt to be repaid in 1000 rupiahs	Installment received in 1000 rupiahs	Balance of debt at the end of 1954 in 1000 rupiahs
1950	Regular	–	–	–	–
	Family	28	2.9	0.7	2.3
1951	Regular	102	442,6	–	442.4
	Family	714	102.1	8.8	92.2
1952	Regular	1,823	6,417.4	–	6,417.4
	Family	2,045	322.1	18.8	303.3
1953	Regular	8,939	18,341.7	–	18,341.7
	Family	1,073	159.7	1.8	157.9
Total		14,724[1]	25,788.2	30.1	25,758.1

[1] If the average size of the family is considered to be 4.5 persons, the number of migrants does not correspond with the actual number of migrants given in Table 88. This difference is explained by the fact that there is another breakdown of families in the migration area due to marriages, etc.

Source: Department of Transmigration. *Penjelenggaraan transmigrasi 1954*, Djakarta, 1955, p. 34.

Table 86. Number of transmigrants by territory of origin, 1962.

	General transmigration		Special transmigration[1]		Total	
	no. of families	no. of persons	no. of families	no. of persons	no. of families	no. of persons
West Java	384	1835	274	1193	658	3028
Central Java excl. Jogjakarta	1049	4505	1442	5468	2491	9973
Jogjakarta	249	1057	136	590	385	1647
East Java and Bali	637	3532	436	1914	1073	5446
Other Lesser Sunda Islands	121	522	152	604	273	1126
South Sumatra	175	909	–	–	175	909
Celebes and other territories	–	–	–	–	–	–

[1] Comprising members of previously migrated families, local migration, transmigration on own account, transmigration for reasons of security, and repatriation of people from Surinam. Including also settlement of war veterans for the reconstruction settlements of the National Bureau for Reconstruction (BRN) and the Bureau for Rehabilitation of Veterans (CTN).

Source: *Statistical pocketbook of Indonesia 1963*, p. 23.

Table 87. Number of transmigrants by area of settlement, 1962.

	General transmigration		Special transmigration		Total	
	no. of families	no. of persons	no. of families	no. of persons	no. of families	no. of persons
North Sumatra	0	0	128	466	128	466
West Sumatra	100	481	0	0	100	481
South Sumatra	735	3,641	2,112	9,103	2,847	12,744
Riau Archipelago	58	275	0	0	58	275
West Borneo	2	9	0	0	2	0
East Borneo	606	2,805	0	0	606	2,805
Central Borneo	281	1,225	0	0	281	1,225
South Borneo	743	3,504	0	0	743	3,504
Celebes	90	420	0	0	90	420
Western Lesser Sunda Islands	0	0	200	200	200	200
Total	2,615	12,360	2,440	9,769	5,055	22,129

Source: *Statistical pocketbook of Indonesia 1963*, p. 24.

Table 88. Number of transmigrants 1938–1940 and 1953–1962.

	General transmigration		Special transmigration		Total	
	no. of families	no. of persons	no. of families	no. of persons	no. of families	no. of persons
1938	–	–	–	–	–	33,399
1939	–	–	–	–	–	44,694
1940	–	–	–	–	–	52,208
1953	8,848	35,432	1,054	3,995	9,902	39,427
1954	7,470	26,239	1,112	3,953	8,582	30,192
1955	4,316	16,665	1,171	4,724	5,487	21,389
1956	4,281	18,232	1,484	6,118	5,765	24,350
1957	4,870	12,509	2,288	10,721	5,158	23,230
1958	2,385	10,610	3,870	15,809	6,255	26,419
1959	5,826	23,963	5,613	22,133	11,439	46,096
1960	2,500	10,295	3,122	11,780	5,622	22,075
1961	3,369	14,709	1,695	4,900	5,064	19,609
1962	2,615	12,360	2,440	9,769	5,055	22,129

Source: *Statistical pocketbook of Indonesia 1963*, p. 24.

KEYFITZ and WIDJOJO have indicated that the amount received by the settlers constituted about 50% of the total expenditures for moving one family.[145]

Since no indices for the cost of living are available, the rupiah expenditures for transmigration have been deflated by a price index for twelve articles of food at prevailing market prices in rural districts of Java and Madura.[146] Such an index is assumed to reflect the purchasing power of the rupiah (see Table 83).

The 'deflated' cost of moving people to the Outer Islands has steadily increased during the postwar period. Total cost figures for 1955 are not available, but a rise is indicated by the fact that the estimated transportation cost per family in 1954 was Rp 492, whereas in 1955 it was Rp 598, an increase of 18%.[147]

Table 84 provides a specification of the amount received per average size family from 1951 till 1954. The figures for 1954, the latest available when the investigations were completed, show the procentual distribution over the various items of the amount received per family.

Housing, clearing 1.5 ha of land, initial living expenses and transportation are the main items included in the amount spent on a family; they constitute 40.2, 16.1, and 25.7 per cent. respectively.

Table 85 shows the indebtedness of the migrants to the government. The inability of migrants to repay the loan is obvious. Practically none of the debts of the people moved under the regular transmigration scheme have been repaid. The repayment of the loans to the migrants under the family transmigration[148] scheme has been unsatisfactory as well: only Rp 30,000 out of a total of nearly Rp 26,000,000 has been repaid here.

7.1.10. Results of organized agricultural resettlement

The number of settlers and dependents moved is illustrated by the Tables 86, 87 and 88. Most of the migrants have settled in South Sumatra, the remainder being spread out over the other areas.

7.2 Survey of spontaneous agricultural resettlement during the postwar period

Up to 1957 the government was not concerned with 'spontaneous' transmigration, but this idea of additional transmigration practically without financial aid from the government is receiving more and more support. Under this new plan, the role of the

[145] KEYFITZ and WIDJOJO, *op. cit.* (*fn.* 126), p. 127.

[146] These twelve articles of food are: rice, corn, cassave, peanuts, soybeans, buffalo meat, dried and salted small fish, hen eggs, coconuts, coconut oil and salt.

[147] *Penjeleggaraan transmigrasi 1954*, Djakarta, 1955.

[148] Family transmigration refers to persons who join relatives previously established in the colonies.

government would be restricted to clearing the forest and to make social overhead investments, whereas all other expenses should be met by the migrants themselves.

But Javanese farmers are reluctant to emigrate to the Outer Islands without government support, and the large-scale movement as in Burma, Thailand and the former Indo-China are unknown in Indonesia.[149] The explanation is that in the Indo-Chinese peninsula transport is much easier. Moreover, people from these three countries moved to areas where the quality of the soil is as good as or even better than that of the land they left. In Indonesia it is just the reverse: Javanese farmers have to move from fertile, volcanic Java to the usually less fertile lands of the Outer Islands.

But if agricultural resettlement is to be increased in Indonesia, some way must be found to encourage spontaneous transmigration. Then it may be expected that more people can be transferred from overpopulated Java to the Outer Islands and the average cost to the government for moving the people could be substantially reduced.

The statistical data on spontaneous migration are rather confusing or inaccurate. But it should be kept in mind that estimates of spontaneous migrants are by necessity based on questionable assumptions. However, such estimates may be used for their broad demonstrative value. An attempt was made by the author to study the voluntary movements between Java and Sumatra in 1953.[150]

An indication of the number of spontaneous migrants to Sumatra can be found from the number of persons transported by the State Railway ferry service from Merak (West Java) to Pandjang (South Sumatra) and back.

The figures show that in 1953, 97,998 persons were transported from Merak to Pandjang, and 82,209 from Pandjang to Merak.[151] The difference suggests that in this year at least 15,800 persons remained in Sumatra.

Of course this is only a very crude estimate, as there are other transport possibilities. Transport by air is usually too expensive and can be neglected. But to move by shipping lines may be financially possible for some migrants. Nevertheless this number cannot be very large, as the ships have only a limited capacity which also appear from the fact that the Department of Transmigration always has to charter special boats for its settlers. The conclusions seems justified that an additional 20% of migrants may be added to the total of 15,800 ,so that in 1953 about 19,000 people may have migrated on their own account from Java to Sumatra (Table 89).

Moreover, the Department of Transmigration took care of a number of people who wanted to join relatives in the new settlements. This concerned 1783 persons, nearly all with destination of Belitung (South Sumatra).[152] The government provided them with loans and land. The Ministry of Labour organized, in cooperation with some planta-

[149] Lectures on Asian Economic Development, given by Professor F. GOLAY, Cornell University, Ithaca, NY.

[150] Here 1953 is chosen because only in that year sufficient data were available.

[151] State Planning Bureau, *Questionnaire for Indonesia, M 700/XII/54/30*, Djakarta, 1954.

[152] Actually this is a total figure for 1950 to 1954. Since there is no specification for the year 1953 (the year in which the Department of Transmigration started to operate effectively) and the total number for the 4 years is relatively small, the author assumes the total amount as acceptable for the year 1953 (see footnote 151).

Table 89. Number of spontaneous migrants from Java to Sumatra in 1953.

Way of migration	Number of migrants
Moved by ferry of State Railway	19,000
Organized by Department of Transmigration	1,783
Organized by Ministry of Labour	5,774
Total	26,557

Source: Compiled from several publications.

Table 90. Number of workers and their families departing from Java and Madura to be employed in industries or on estates in other islands.[1]

	Male	Female	Houshold members of the workers on contract		Total
			female	children	
1938	–	–	–	–	23,334
1939	–	–	–	–	25,347
1940	–	–	–	–	24,310
1951	6,596	3,961	1,572	6,286	18,415
1952	7,869	5,741	1,671	7,607	22,888
1953[2]	2,117	1,293	491	1,562	5,463
1954	1,528	1,330	99	1,347	4,304
1955	4,188	2,238	1,905	3,897	12,228
1956	3,098	1,929	1,146	3,376	9,549
1957	970	720	269	796	2,755
1958	1,400	951	449	1,101	3,901
1959	1,867	1,336	531	1,502	5,236
1960	5,901	5,018	883	5,868	17,670
1961	6,237	4,974	65	5,386	16,662
1962[2]	5,700	5,782	3	6,508	18,083

[1] Data supplied by: Free Emigration of the Sumatra Planters Association (FESPA), Zuid West Sumatra Syndicate (ZWSS), Pusat Perkebunan Negara (PPN) and Standard Vacuum Petroleum Maatschappij (SVPM).

[2] Exclusive workers from Java and Madura migrating through the intermediary organizations or those mentioned under footnote 1. Their number amounted in 1952, 1953 and 1962 to 311, 342 and 817 persons, respectively.

Source: *Statistical pocketbook of Indonesia 1963*, p. 279.

tions, the transfer of groups of workers to be employed in Sumatra; in 1953 their number was 5774.[153]

The various estimates of the number of spontaneous migrants to Sumatra are combined in Table 89; the total is between 26,000 and 27,000.

Excluding these plantation workers (who actually are not real migrants because they may return to Java) the total number of spontaneous migrants amounted in 1953 to $19{,}000+1/5\times 5774$ or very roughly 20,000 people. If it assumed that 50 to 70% of them found their occupation in agriculture, the conclusion is that in 1953 between 10,000 and 14,000 farmers (including their dependents) spontaneously went from Java to Sumatra.

This type of migration becomes significant when compared with organized resettlement of the Department of Transmigration which, in 1953, moved a total of 40,000 persons.[154] Of course, the estimate of spontaneous migration cannot be judged by the results of one particular year. But as earlier explained it can be used for their broad demonstrative value, namely to show that the spontaneous migration scheme deserves further exploration as a means of speeding up transmigration plans in the future.

It is interesting to see the numbers of persons and their households from Java and Madura who are attracted by the estates and other enterprises in the Outer Islands (Table 90). The conclusion is that these movements are of limited value to relieve the population problem on Java as a maximum of only 23,000 persons could be employed anually in the postwar period.

To persuade people to move from fertile Java to the less fertile Outer Islands, the government has to provide a minimum land holding sufficient to provide the settlers with a living. This concept has been defined by LEWIS[155] as the ability "to earn as much on the land as he could earn if he went to town and did the sort of work men of his education and ability can get". Such a definition presupposes the existence of alternative labour opportunities in the cities.

According to the Population Census 1961, the urban population of Djakarta, Surabaja, Bandung and the other 'Kota-kota Autonom' (municipalities) increased from 2.2 million in 1930 to 7.8 million in 1961.[156] It has therefore much more than tripled, partly due to surplus births. The surplus births for the whole of Java amounted in the same period to 51.2%. If the large cities had followed the same pattern, their increase in population would have been 51.2% of 2.2 million or about 1.1 million. Actually it was 5.6 million, which means a move of roughly 4.5 million people to the towns.[157] A study carried out by the Institute of Economic and Social Research of the

[153] *Statistical pocketbook of Indonesia 1963*, p. 279.

[154] See Tables 87 and 88.

[155] A. W. LEWIS, Thought on land settlement, *J. Agric. Econ. 6 (1)*, 1950, p. 8.

[156] TAN GOAN TIANG, Growth of Cities in Indonesia 1930–1961, *Tijdschr. Econ. Soc. Geogr.*, mei-juni 1965.

[157] *Ibid.*

School of Economics in Djakarta has shown that indeed the migration to the city means a rise on the social ladder.[158] But if this flow is maintained at the rate mentioned above, it certainly will depress the wages there and increase unemployment, unless industrial expansion keeps at pace with it. This has not been the case in the period after 1957. The consequences of this continuous urbanization are various social problems in housing, sanitation, prostitution, etc. They deter the sound development of the community, and the problems become more complex when the cities grow. Most of the migrants' movement from the rural areas into the towns is not caused so much by a need of more inhabitants in the towns, but by population pressure and a general 'charm' of the city.[159] On the whole it would be more beneficial if a part of the desire to move from overpopulated villages could be steered into a desire to move, spontaneously and independently, to the Outer Islands.

It is clear that, to promote a large-scale spontaneous move of Javanese farmers to the Outer Islands, a high degree of cooperation and participation by all elements of the Indonesian population is required. The task of the settlement program must not be the responsibility of the government only, but it must be considered by the Indonesian population as a national goal.

KEYFITZ and WIDJOJO have proposed that, if each village on Java assumes the responsibility to move a certain number of families (especially the younger people) to the Outer Islands through its own effort (e.g. by providing loans to the settlers), more funds would be available to the government for building irrigation dams and roads, and clearing the forest. More people could then be moved and the capacity of the new areas to absorb people would be increased by these large development projects.[160]

It is possible that some parts of the investment expected to materialize in the Community Development Program could be used not only to improve the living conditions in the villages, but also by providing funds for transporting people from their villages in Java to the Outer Islands. In the Indonesian five-year plan (1956–1960) it was expected that the village community sector would provide Rp 7500 million or 25% of the total investments of their purposes.[161]

There might also be possibilities for implementing a community development at the other end, namely in the resettlement areas themselves. In this context it may be appropriate to conclude this subject with the remarks of Dr. D. K. DEY, Community Project Administrator in India, who has worked several months at the State Planning Bureau in Djakarta[162]: "Indonesia needs looking back at her own image in the mirror. She will discover how the dark valleys were cleared of pestilence and parasites

[158] The urbanization of Djakarta, *Ekonomi dan Keuangan 8*, 1955, p. 707.
[159] State Planning Bureau, *The population of Indonesia*, p. 6.
[160] KEYFITZ and WIDJOJO, *op. cit.* (*fn.* 126), p. 132.
[161] State Planning Bureau, Some explanations on Indonesia Five-year Development Plan, 1956–1960, *Ekonomi dan Keuangan 9*, 1956, p. 667.
[162] DEY, *op. cit.* (*fn.* 144), p. 50.

and how these were transformed into the greenland orchards of today through the labour of love done through community music over centuries. The Community Development Program in Indonesia is old wine in a new bottle and is but a restatement of the old challenge 'Gotong royong or alang-alang?' (mutual aid or alang-alang grass land).

7.3 Will resettlement remain desirable?

Will resettlement in general remain desirable in the future? If so, in what form and to what extent?

The author tends to agree with VAN DER LEEDEN that the first question has to be answered most definitely in the affirmative. The efficient economic development of the large, sparsely populated territories outside Java is of great importance, and political considerations of a national and also an international nature even make it imperative.[163]

As to the second question, the government once designed a plan for moving 18.5 million Javanese within 30 years, starting in 1951. Agriculture organized on a commercial basis in the Outer Islands was the basis of the plan. Increasing emphasis was placed on the development of industry in all its forms. This industrial development, which was to supplement the industrialization program of Java, was expected to supply the dynamic forces necessary for a satisfactory solution of the welfare problem of the Javanese people and of the exploitation problem of the vast Outer Islands. In short, settlers were to form the core of a greater industrialization program for the whole of Indonesia.

However, the government had to drop this ambitious plan because of financial and technical reasons. The budget figures of the Department of Transmigration show that in 1951–1955 a total of 180 million rupiahs has been spent for this purpose. In the five-year plan 1956–1960 a total cost of 383 million rupiahs (3% of the total public investment) was allocated and about 200,000 persons were to be moved from Java, based on the achievements during the 1951–1955 period.[164] But due to the inflation, there was virtually no increase in the real expenditures.

As indicated earlier in this study, the Indonesian National Development Plan 1961–1968 includes a more ambitious program, namely moving 2,000,000 persons from Java to the Outer Islands during 8 years. While in the five-year plan about 140,000 persons have migrated from Java, of the eight-year plan only a small part will probably be carried out as up till 1963 only 55,000 persons have been moved.[165]

[163] C. R. VAN DER LEEDEN, *Het aspect van landbouw-kolonisatie in het bevolkingsprobleem van Java*, den Haag, 1952, p. 224.

[164] See footnote 102, pp. 257–266. The cost of moving one person is estimated at about Rp 1800, exclusive irrigation and other overhead costs. See further: *Statistical pocketbook of Indonesia 1963*, pp. 23–24.

[165] Compiled from several sources, among others from the *Statistical pocketbook of Indonesia 1963*.

If the government follows its present policy, in the long run it will be defeated in two ways by the rising costs. On the one hand, the cost of organized migration continued to rise along with inflation, on the other hand, as less suitable areas become involved, wet cultivation outlays for irrigation become increasingly costly and the point will be reached where irrigation is no longer economically justified. It may be that these problems can be met by the government by encouraging both spontaneous migration and dry field cultivation.

However, it still remains obvious that there is no possibility of solving the Javanese problem by means of transmigration. It is to be expected that at best transmigration will provide employment opportunities for a significant number of Javanese farmers without solving the many problems for those left behind in Java. While it may be expected that transmigration will hasten the economic growth of the other islands, it is evident that transmigration alone can be of only limited value for the solution of Java's demographic and economic problems. More about this subject will be given in Chapters 10 and 11.

8 Rehabilitation of the sugar factories

8.1 The poor state of sugar production

In the past the sugar factories, spread over the vast plains of Java, were mainly owned by foreigners who rented the fields from the farmers.[166] Thus the influence of non-indigenous activities penetrated more deeply into the social and economic life of the village than was the case with the upland estates. Their high labour requirements, and the rotation between estate and peasant agriculture left their mark on the whole economy of the area all around. Therefore, the economic crisis in the thirties had a very great impact on the economic situation. No accurate balance can be struck as to the effect on the local population of the resulting great fall in the wages formerly paid to the 60,000 permanent and about 700,000 temporary labour force. Although the loss was largely offset, as the land formerly rented became available for food or other crops, the farmers were the main victims, especially the landless and very small ones. This was felt all the more because the inhabitants of the sugar producing areas had, to a great extent, based their lives on a cash economy founded on wage payment.[167]

Compared with prewar times, there is at present a greater variation in the way cane is produced:

(a) The land is hired for about 18 months from the peasants. Before the war, factories negotiated the short-term contract with the individual farmers; nowadays the rent is regulated by the government.

(b) Cane is bought from independent farmers. During the prewar period this was possible only for the factory on a very small scale with a special permit from the government. After the war, some factories relied to a large extent on this method.

(c) A crop-sharing arrangement is established between factories and farmers. The rate has become 60% of the yield to the farmer and 40% to the factory, but this has not proven to be very attractive to the farmer. There is now talk of 70% to 30% to encourage the farmers to join this arrangement.

(d) Profit-sharing arrangements are established between factory and farmers. There is no information available on this method and its operation, because it is still in a pilot stage.[168]

[166] For the way factories obtained their land for sugar cultivation in the prewar period see Chapter 4.

[167] PIM, *op. cit.* (*fn.* 9), pp. 24–25.

[168] E. DE VRIES, *Agro-economic survey of Indonesia*, Report to the Ford Foundation, August 1966, pp. 19–20.

Table 91. Number of sugar factories by landrights, Java, 1963.

	Number of factories	Acreage owned by factories	Acreage hired from peasants[1]	Number of peasants	Total acreage
West Java	6	339	8,305	19,379	8,644
Jogjakarta	1	17	479	4,890	496
Central Java	16	968	23,358	83,167	24,326
East Java	33	13,607	41,502	104,846	55,109
Total	56	14,931	73,644	212,282	88,575

[1] Excluding one factory in East Java which only processes peasants' cane.

Source: *Hasil sensus perkebunan 1963*, table 3B.

Table 92. Quantity of crushed cane by source, 1963 (in 1000 tons).

	Total cane		Cane from land owned by factories		Cane from land hired from peasants		Cane bought from individual peasants	
	Factories	Quantity	Factories	Quantity	Factories	Quantity	Factories	Quantity
West Java	6	581	1	0	6	580	1	0
Jogjakarta	1	25	–	–	1	25	–	–
Central Java	16	1482	1	0	16	1467	5	14
East Java	33	4122	6	403	32	3089	22	630
Total Java	56	6210	8	403	55	5162	28	645

Source: *Hasil sensus perkebunan 1963*, Table 5.

Table. 93. Planted area, production and average yield of sugar from lands cultivated by factories in Java.

	Planted area in 1000 ha	Production in 1000 tons	Average yield in tons per ha
1938	84.8	1,375.6	16.2
1962	82.5	588.7	7.1
1963	80.1	650.6	8.0

Sources: Biro Pusat Statistik, Planted area, production and stocks of principal estate crops, 1962, pp. 2 and 48 (for 1962), *Hasil sensus perkebunan 1963* (for 1963) and C. J. J. VAN HALL and C. VAN DE KOPPEL, vol. I, pp. 394–395 (for 1938) (see footnote 56).

During the postwar period the sugar industry in Java has changed in several respects; the three main points are the following:

(1) As earlier explained in Chapter 4, the production declined due to both a decrease in yield per hectare and in cane area (see Table 93).
(2) Whereas before the war practically all cane used for centrifugal sugar production was cultivated on land hired by the sugar factories from the peasants, in 1963 this was estimated on 92% (or 73,644 ha[169]) of the total production. There appears to be a trend for further decline in the future.[170]
(3) The *per capita* consumption is at present higher than in the prewar period: about 8 kg as against about 5 kg.[171] Due to the declining production and the higher consumption, there is less available for export.

The development of total area planted, the production and the yield per hectare of sugar originating from land cultivated by the factories themselves can also be seen from Table 93. For a better understanding of the factors which caused the obvious decline after the war, it may be useful to study the high achievements accomplished in the prewar period.

The impressive success of the sugar industry (before the war Java had the highest yield per hectare) was to a great extent due to an efficient and low-cost production of cane with a high sugar content. From 1886 to 1941, the research work, especially that of the experimental station at Pasuruan, steadily increased the yield both from field and factory.[172] Much attention had to be paid to the economic use of the irrigation water as its quantity was limited not only by the capacity of the irrigation canals, but also by the requirements of peasant crops. A systematical rotation of crops was established. The different soil types were catalogued. On every large plantation the result of the soil analyses was plotted on large-scale maps. In this way the most suitable manure was determined by the extension officer in charge of fertilization.[173]

Nevertheless the rise in yield was due more to selection of high producing strains than to improvement in cultivation methods. The most famous strain was the POJ 2878. By 1929, it covered 90% of the cane area in Java. The average yield was then up to nearly 15,200 kg sugar per hectare. This cane not only gave a high yield, but it was also immune to 'sereh' and other diseases, and it was far less sensitive than any other strain to differences in soil and climate.[174] Since the war, the Sugar Research Institute at Pasuruan, has developed two other strains, POJ 3016 and POJ 3067, which are supposed to be even better than POJ 2878.[175]

[169] See Table 91.

[170] However, it is possible that production could be increased considerably on the existing area if the causes of the fall in output will be removed.

[171] International Sugar Council, *The world sugar company structure and policies*, London, 1963, Vol. 1, p. 222.

[172] ROBEQUAIN, *op. cit.* (*fn.* 9), p. 341.

[173] *Ibid.*, p. 342. [174] *Ibid.*

[175] THOE SOEN BIE, Preliminary variety traits in the crop year 1959, *Berita-berita perusahan gula 1965*, pp. 1–82.

Yet the yield per hectare declined by about 50% (Table 93). This can partly be attributed to irrigation difficulties, less efficient methods of cutting and handling, late arrival of fertilizers, insect plagues and thefts. Besides these, three problems stand out in importance, namely: the problems relating to the soil, the labour resources (primarily skilled labour) and the bad state of the old sugar factories.

Despite the present disconcerting position of the Java sugar industry, there are certain factors amid the general uncertainty which justify a review of its prospects and possibilities, and some tentative practical proposals for its rehabilitation do not seem out of place.

8.2 The problem of the soil

Under the Agricultural Law of 1870, the sugar factories obtained the soil by a complex system in which it was rented from the peasant for 3½ or 21½ years. The best soils with a good water supply could be selected, and sugar cane was grown alternatively with food crops. A typical cropping cycle runs as follows:

	First third of sawahs	Second third of sawahs	Third third of sawahs
Year 1: dry season	newly planted cane	harvestable cane	dry crops
wet season	growing cane	wet rice	wet rice
Year 2: dry season	harvestable cane	dry crops	newly planted cane
wet season	wet rice	wet rice	growing cane
Year 3: dry season	dry crops	newly planted cane	harvestable cane
wet season	wet rice	growing cane	wet rice
Year 4: as year 1.			

In order to secure the supply of cane at present, vertical disintegration, by which growing is separated from processing, is encouraged by the government.

In 1960, the law of 1870 was revoked; instead, the Basic Agrarian Law no. 5 was sanctioned by the Parliament. Based on the 'hak sewah', or right of renting land, it stipulates, among other things, that sugar factories still can rent land from the farmers, but in each sub-district of the sugar areas a maximum and a minimum are assigned for planting with sugar-cane, to be fixed by a decree of the Minister of Agriculture and Agrarian Affairs, on advice of the Governor and a special committee of the region concerned. In this decree the procedure for settling the annual rent is also regulated. According to this law, the contracts are renewed for each cultivation period and usually each time different soils are allotted.

The government fixes the domestic prices for sugar.[176] Before the war these prices were about twice that of rice, after the war they were often lower.[177] This results in

[176] Actually the price policy of the government is a complicated matter. These matters will be discussed when examining the government's sugar policy. See also Table 105.
[177] See Table 105.

low land rents, especially when compared with those in the free market: the farmers could get better prices if they cultivated rice or other crops. In other words, the peasants did not like to cultivate cane at low prices and they tried to evoke the regulations by giving the poor soils to the sugar factories. In places with communal landholdings, they cooperated for this purpose.

Later on the government increased the rent to a reasonable level, but still farmers are only willing to rent that part of their land which is onbly suitale for cultivating less profitable crops.[178]

Often the area allocated for sugar industries consists of scattered plots. This causes delay in delivery and higher costs for transport to the factory, and since the cane have to be crushed immediately after cutting, this also means a lower output of juice.

In 1963, 80,114 ha was planted with cane of which 73,644 ha or 92% was leased from the peasants, while the remaining 6470 ha or 8% was owned by the factories.[179]

To restore the sugar industry to the level of before 1933–1934, one of the problems is how to obtain large coherent areas with fertile soils where sugar factories can work on a long term basis. As the presently operating sugar factories have a much greater capacity than the old ones, they need over 1000 ha for economical operation. If smaller units could be constructed, perhaps a few hundred hectares of land would be sufficient, which would be much easier to obtain (see 8.4).

Another system which might be successful is, that the factories obtain a greater part, if not all, of their supplies by contract from small growers instead from their own crop grown on leased lands with hired labour.[180] Then the farmers have their own share in the responsibility for the production process.

To maintain the quality of the cane and to avoid any fatal risk caused by the cultivation of inferior cane, cultivation should be put under scientific supervision of agricultural experts, either from the Ministry of Agriculture or from the factories.

It must also be kept in mind, that a large central factory represents a considerable investment. If sugar factories have to depend on areas cultivated by farmers, incentives should be created for persuading the peasants to plant sugarcane and not to change to another crop. Possibly a fair price for their cane or a profit sharing arrangement between the factory and the farmers could solve this problem. Since this new form of cooperation is still in a 'pilot project' stage, it seems advisable to wait for the results before more detailed well-founded recommendations are suggested.

[178] DE VRIES, *op. cit.* (*fn.* 168), p. 20. Probably the rent set by the government is still relatively too low as compared with what the farmers could get if they plant their land with other crops. In early August 1966, there was a proposal to increase the sugar price from Rp 3.38 per kg to Rp 5.58 wholesale off factories an increase of 65%, in order to give farmers more rent from their land. But even this substantial increase might not be enough to persuade the farmers to rent their best land to the factories. We will come back on these matters later in this study.

[179] See Table 91.

[180] I. C. GREAVES, *Modern production among backward peoples*, London, 1935, p. 104.

8.3 The problem of labour

Since 1958, practically all sugar factories (about 90%) have been run by the government as state enterprises, as shown in Table 94. Although labour difficulties then decreased due to the improved relations between employers and employees, yet the shift from private foreign to state enterprises affected the industry in an unfavourable way, as apparent from the following pages.

The take-over of sugar factories caused difficulties in management and administration. When the Dutch experts departed after 1957, they were replaced by less trained and less experienced Indonesian personnel. The distribution of personnel according to education level is illustrated in Table 95. In 1963 of the 2558 staff members running the 56 factories, only 17 (less than 1%) were University graduates and 202 or 8% were from the sugar academy. This low standard of skill naturally militates against efficient production. The problem was then, how and where to put the available trained people so that they work most productively and maximum use of their skill could be made. The fact that they had to work in more than one factory had to be considered temporary justified only to overcome the short supply, but efforts were made to train a sufficient number of people to fill the vacancies.

Of the 360,226 workers, 7% were permanent employees, comprising both staff members and labourers (Table 96). Their salaries were based on government regulation and paid on a monthly basis.

Government regulation no. 14, 1962, as amended by no. 21, 1963, provided for a wage scale and a system of allowances varying according to marital status, size of family, etc. Apart from their money wage, the workers receive rice, sugar, textile and several other necessities at subsidized prices. In addition, all employees are supplied with transport facilities (usually buses) or with travel allowances. A limited number even has free use of a car and free housing. Nevertheless the wages are inadequate to supply the worker with the minimum comfort.

It is not surprising, that under such circumstances it has not been easy to get the best people to join the sugar factories. Many of them leave again under pressure of the increasing prices for daily necessities to look elsewhere for a better income. If they stay, this means that either the wife must also work or that they must moonlight[181], a practice which cuts into a worker's leisure, affects his health and depletes his energies. Of course, this has a bad effect on the efficiency of the worker which results in a low productivity and robs the management of discipline.

Though the government had to guarantee an annual income which undoubtedly created some sense of security, workers would probably have had more security if they had got a salary more in line with private enterprises or where earnings were commensurate with the living requirements, and were responsive to differentials in skill, industriousness, ingenuity and other variables worthy of reward.

[181] They are forced to work outside their main job to earn an additional income to have a reasonable living.

Table 94. Number of sugar factories in Java by type of enterprise, 1963.

	Number of factories	State enterprises	Private enterprises
West Java	6	6	–
Jogjakarta	1	–	1
Central Java	16	15	1
East Java	33	31	2
Total	56	52	4

Source: *Hasil sensus perkebunan 1963*, Table 1.

Table 95. Education level of staff members in sugar industry in Java, October 1963.

	University	Academy	Agric. school	Techn. school	Other vocational schools	General second. school	Primary school	Total
West Java	1	25	40	66	81	122	3	338
Jogjakarta	1	4	6	12	3	12	–	38
Central Java	6	57	108	168	102	242	18	701
East Java	9	116	288	291	194	568	45	1511
Total	17	202	442	537	380	944	66	2588

Source: *Hasil sensus perkebunan 1963*, Table 17.

Table 96. Size of labour force of sugar factories in Java, October 1963.

Staff members	2,588
Other permanent employees	23,778
Labourers paid on a daily basis	333,860
Total	360,226

Source: *Hasil sensus perkebunan 1963*, Table 16.

Table 97. Minimum daily wages in some selected sugar factories[1] (in Rps).

	1958	1959	1960	1961	1962
For single workers:					
in money	4.50	4.75	5.00	6.00	6.25
in kind[2]	2.65	3.14	3.99	4.86	4.86
total value	7.15	7.89	8.99	10.86	11.11
For married workers with 2 children:					
in money	4.75	5.00	5.25	6.00	6.25
in kind[2]	5.95	9.32	9.32	11.44	18.37
total value	10.70	14.32	14.57	17.44	24.62

[1] Estates workers united in the Association of Sugar Factory Workers.
[2] Converted in accordance with official (subsidized) prices.

Source: *Statistical pocketbook of Indonesia 1963*, p. 281.

Table 98. Number of workers in sugar factories in Java, 1930 and 1963.

	Number of factories	Total production in 1000 kg	Permanent employees	Casual labourers
1930	180	3,000,000	54,000[1]	1,000,000
1963	56	650,000	26,000	334,000

[1] The 54,000 people permanently employed included 4,000 Europeans.

Source: from several publications.

Table 99. Year of construction of sugar factories in Java.

	Number of factories[1]	Percentage of total number
Before 1914	48	87
1914–1929	5	9
1942–1963	2	4

[1] One sugar estate in Central Java has no mill; the cane is milled by a factory in West-Java.

Source: *Hasil sensus perkebunan 1963*, Table 18.

Table 100. Percentages sugar processed from cane by old and new factories.

Year of construction of factory	Number of factories[1]	Average quantity of sugar (in kg) produced from 100 kg cane
before 1929	53	10.1
1942–1963	2	11.0

See footnote Table 99.

[1] Source: *Hasil sensus perkebunan 1963*, Table 18.

Table 101. Number of factories[1] by number of days of maximal daily milling, 1963.

	0 days	1–5 days	6–10 days	11–20 days	21–30 days	31–45 days	46–60 days	>60 days	Unknown	Total
West Java	–	–	–	2	1	–	–	1	2	6
Jogjakarta	–	1	–	–	–	–	–	–	–	1
Central Java	1	–	1	4	4	3	–	1	1	15
East Java	–	–	–	24	1	–	–	4	4	33
Total Java	1	1	1	30	6	3	–	6	7	55

[1] See footnote Table 99.

Source: *Hasil sensus perkebunan 1963*, Table 23.

Table 102. Number of sugar factories by number of milling days, 1963.

	<45		46–60		61–75		76–90		91–105		>105	
	fact.	total days	fact.	total days	fact.	total days	fact.	total days	fact.	total days	fact.	total days
West Java	–	–	–	–	1	61	4	314	–	–	1	143
Jogjakarta	1	26	–	–	–	–	–	–	–	–	–	–
Central Java	3	117	1	46	2	136	5	413	3	285	1	356
East Java	–	–	1	60	8	555	5	426	8	789	11	3193
Total Java	4	143	2	106	11	752	14	1153	11	1074	13	3692

Source: *Hasil sensus perkebunan 1963*, Table 24.

Table 103. Number of working days and lost labour hours in sugar factories in Java, 1963.

	Number of factories[1]	Number of working days	Number of working hours lost
West Java	6	484	492
Jogjakarta	1	26	9
Central Java	15	1114	1931
East Java	33	3404	6838
Total	55	5028	9270

[1] See footnote table 99.

Source: *Hasil sensus perkebunan 1963*, Table 24.

Table 104. Additional land needed by factories to extend their milling season (Java, 1963).

	Necessary extension								Total number of factories	Total additional land needed (in ha)
	>30 days		31–60 days		61–90 days		<90 days			
	fact.	ha	fact.	ha	fact.	ha	fact.	ha		
West Java	2	300	–	–	–	–	–	–	2	300
Jogjakarta	–	–	–	–	–	–	1	1,500	1	1,500
Central Java	2	460	2	500	1	200	–	–	5	1,160
East Java	7	1,925	1	110	–	–	1	1,200	9	3,235
Total Java	11	2,685	3	610	1	200	2	2,700	17	6,195

Source: *Hasil sensus perkebunan 1963*, Table 25.

As for the casual labourer, the wages are determined by collective labour agreements negotiated by the directors of the sugar factories and representatives of the labour union. They are valid only for a certain period. These wages are composed partly of money and partly of kind. Their development can be seen in Table 97.

The existing labour law restricts enterprises, including those privately owned, to dismiss inefficient workers. Therefore, supervision cannot be carried out as it should be in a commercial enterprise. The result is that the cost of operating sugar factories is higher than necessary. This is illustrated in Table 98: to produce the 620,000 tons of sugar, mentioned in this table, about 50% of the 1930 number of permanent employees and 30% of the casual workers were needed, while the total production was only 20%.

It is rather striking, that the labour productivity of field workers has also decreased after World War II. The cause is, that the factories could only get older men to work on the fields. The younger, so much needed for the heavy work in preparing the land for cultivation, prefer nowadays employment in the big cities.

8.4 The problem of the factories

The main problems of sugar factories are: their old age (Table 99) and their below capacity production.

Of the 55 operating sugar factories, 87% are old-fashioned, having been constructed before 1914. Only 4% were built in the postwar period, while the remaining 9% were built between 1914–1929.

Virtually all machinery suffers from deficiencies. Spare parts and accessories to keep them operating efficiently and properly are often lacking. That the average daily processing capacity of the factories in the postwar period was 1627 tons, as against 1200 tons before the war[182] can be explained by the fact that in the postwar period more factories with a high capacity are in operation.

The percentage of sugar extracted from the cane in the postwar period was 10.2%, whereas before the war it was 14–17%.[183] But, as Table 100 shows, the new factories established after 1942 are about 10% more efficient than the old ones. This means that next to the earlier mentioned unfavourable location of the land, the lower labour productivity and higher transport costs, the age of the factories play an important role in their output.

It is not only the lack of foreign exchange that has caused the shortage of imported spare parts; during the 1957–1962 period, when the political relations between Indonesia and the Netherlands were estranged, some vital parts could not be obtained as most of them were manufactured in the Netherlands. But the Indonesian workers have a record of keeping things going. Even with the existing old machines, which cer-

[182] *Hasil sensus perkebunan 1963*, Table 18, and VAN HALL and VAN DE KOPPEL, *op. cit.* (*fn.* 56), deel IIa, p. 368.

[183] VAN HALL and VAN DE KOPPEL, *op. cit.* (*fn.* 56), Vol. IIa, p. 365.

tainly would have been disapproved by modern technologists, they were able to operate and "as long as production was still possible from a plant, the age of a machine has been best measured not in terms of its date of manufacture, but rather by its prospective productive life."[184]

Assuming that the remaining productive life of the sugar factories is on the average about ten years, the problem now is how to get a maximum return during that period, before they will be replaced by new machines.

But even if new machines should be introduced, the sugar factories still face another problem. Today, the specialized machines with automatic devices require different skills from those existing at present in Java. The problem arises then where and how to get trained and experienced technicians with sufficient know-how to operate these machines.

The second problem is the below capacity production of the present factories (see Table 101). It seems that only 13 factories work on full capacity, namely more than 105 milling days (Table 102). Besides that there is not enough cane to be processed, due to break down of field machines and labour difficulties, so that the 55 factories lost an average of nearly 2 hours of each 8 hour working day (Table 103).

Out of the 55–13=42 factories working below their capacity, 17 (or 40%) would be able to work on their maximum output if sufficient raw material was available. Table 104 shows the areas needed for such an expansion. It is striking to notice that the other factories working below capacity are not eager to extend their area; perhaps the sugar price is not attractive enough for them to increase their production.

8.5 The sugar policy of the government

After 1950 there was a time when farmers could plant and sell sugar cane in the free market. But later on, under the pressure of a severe cane shortage from the sugar factories' own plantations, from time to time the government had to issue regulations in which the farmers were compelled to plant and sell cane to the factories. In other words: the sugar production became subject to government control.

At present the wholesale prices for centrifugal sugar are fixed by the government (Table 105). Retail prices are from time to time controlled, especially when there is a shortage in the market. This is also the case with the price of cane.

Price increases are primarily caused by the inflation. Furthermore the table indicates that since 1959 the difference between wholesale and retail prices became greater and greater, so that in 1962 the retail price was even about four times the wholesale price. Under such circumstances it can hardly be expected that traders will be much interested in export, as exports are paid in rupiah's at the official rate of the dollar. This can be seen from Table 106.

[184] Development Project Consulting Service, *Indonesian report on industrial working shops*, Vol. I, Djakarta 1966, p. 29.

Incentives to supply the domestic market are equally insufficient for the factories to increase their production; as mentioned before, some of them are even not interested in milling at full capacity.

Full production is economically justified only when the factories can buy cane from farmers at a low price. But when prices are kept low, farmers try to evade selling their cane and instead process brown sugar and sell this in the free market.

Table 107 shows the decrease in production of centrifugal sugar from farmers' plantations; Table 108 demonstrates the rise in consumption of non-centrifugal sugar from an annual average of 57,000 tons over the period 1934–1938, to 97,000 tons over 1951–1955 and to 127,800 tons for the period 1956–1960. This table also shows that the low prices set by the government stimulate consumption *per capita* of centrifugal sugar, by its distribution at a price far below the free-market price.

Table 105. Prices for cane, wholesale and retail sugar, 1953–1962.

	Cane price per 1000 kg[1]	Wholesale price to retailers in Rps per 1000 kg	Retail price per kg in Rps	Ratio between retail and wholesale price
1953	113	–	–	–
1954	123	3,080	3.18	1.03
1955	119	3,060	3.29	1.08
1956	130	3,020	3.33	1.10
1957	139	3,500	3.94	1.13
1958	165	4,180	4.92	1.18
1959	171	4,400	5.88	1.34
1960	–	4,650	6.49	1.39
1961	–	5,900	10.75	1.74
1962	–	9,930	36.87	3.71

[1] These prices refer to cane delivered at the factories and are reduced in cases where the cane is transported by the factory itself.

Source: *FAO production year book 1961*, as cited by the International Sugar Council (see footnote 171), p. 222; *Statistical pocketbook of Indonesia 1963*, pp. 257–261.

Table 106. Export of centrifugal sugar, Indonesia, 1938–1940 and 1958–1962 (in 1000 tons).

1938	1939	1940	1958	1959	1960	1961	1962
1,071.1	1,357.7	803.6	87.2	39.0	34.8	0	32.9

Source: *Statistical pocketbook of Indonesia 1963*, p. 151.

Table 107. Production of centrifugal sugar in 1000 tons tel-quel, *1958–1962.*

	From factory plantations	From farmers' plantations	Total	Percent. of total produced from farmers' plantations
1958	588.0	183.2	771.2	24
1959	675.5	179.6	855.1	21
1960	564.6	113.1	677.7	17
1961	582.3	60.9	643.2	9
1961	552.2	36.5	588.7	6

Source: *Statistical pocketbook of Indonesia 1963*, p. 84.

Table 108. Sugar consumption in Indonesia, 1934–1938 and 1951–1960.

	Centrifugal sugar		Non-centrifugal sugar[1]	
	total consumption in tons	*per capita* consumption in kg	total consumption in tons	*per capita* consumption in kg
Av. 1934/38	*308,000*	*4.6*	*57,000*	*0.9*
1951	338,843	4.4	36,000	0.5
1952	436,825	5.6	60,000	0.8
1953	483,080	6.1	141,000	1.8
1954	499,908	6.2	121,000	1.5
1955	642,746	7.9	130,000	1.6
Av. 1951/55	*480,280*	*6.0*	*97,600*	*1.2*
1956	612,808	7.3	139,000	1.7
1957	665,870	7.8	126,000	1.9
1958	704,796	8.0	123,000	1.4
1959	723,906	8.0	126,000	1.4
1960	715,150	7.7	125,000[2]	1.3
Av. 1956/60	*684,506*	*7.8*	*127,800*	*1.5*

[1] For crop years.
[2] Estimate.

Source: International sugar council statistics, FAO, *Commodity reference series 1*, The world sugar economy in figures 1880–1959, as cited by the International Sugar Council (see footnote 171), p. 222.

8.6 Production costs

Table 109 shows that a large part of the production cost of sugar represents payments for rent and wages. The table gives comparative figures for 1925, 1936 and 1960.

Despite the relatively low land rent paid to the farmers, this rent forms 15 to 20% of the production cost, as compared with 7 to 10% in the prewar period.[185]

Since wages are a substantial part of the production cost (estimated at 30–40%,

Table 109. Percentages of total costs of sugar production, spent on rent, wages and other costs items, 1925, 1936, 1960.

	1925	1936	1960
Rents	7	10	15–20
Wages	44	38	30–40
Other items	49	52	40–55

Source: Various publications.

Table 110. Wages[1] paid to permanent and temporary labourers[2] in cane cultivation in Java, in 1000 Rps, 1957–1960.

	Wages paid to permanent and temporary labourers	Bonuses paid to permanent labourers		Total
		at Lebaran[3]	annually	
1957	352,155	4,181	10,362	366,698
1958	398,464	3,810	12,312	414,586
1959	524,215	3,782	9,670	537,667
1960	501,978	2,450	1,993	506,421

[1] Including the gross money wage, the difference between the market value and the price paid for goods supplied by the factory, various bonuses and allowances, and absence payments during leave and sickness.
[2] Includes lower rank labourers (up to and including chief foremen) directly engaged in cultivation work.
[3] Lebaran: the end of the Moslim Fast.

Source: *Statistical pocketbook of Indonesia 1963*, p. 87.

38–44% in the prewar period), the wage problem needs to be solved very soon.[186] The most important point is now to use the labour as efficiently as possible. A solution could be found in increasing labour productivity by inducing the labourers to work harder, or in the dismissal of unnecessary labourers.

The amount of wages paid to the lower rank labourers (including chief foremen) directly engaged in cane cultivation can be seen in Table 110. To these figures must be added the wages paid to other labourers and employees (lower and higher ranks) engaged in the factories, which amount to 30–40% of those paid to labourers in cane cultivation.[187]

[185] Told by Mr. SOSRO MOELJONO, an official working at the branch of the Indonesian Government Estates Office at The Hague. Mr. Moeljono has been involved in this matter for many years. For the prewar figures see H. J. BOEKE, *The evolution of the Netherlands Indies economy*, Haarlem, 1947, p. 45.
[186] Communicated by Mr. SOSRO MOELJONO. In the prewar period, labour amounted to 38–44% of the production cost (BOEKE, *op. cit., fn.* 185, p. 45).
[187] *Statistical pocketbook of Indonesia 1963*, pp. 7 and 8.

8.7 The rehabititation of sugar factories in Java

As seen earlier, till now the Indonesian government has built only two new factories because of the high costs: for one factory with an annual production capacity of 30,000 tons of sugar they amount to US $ 8,500,000.[188] Therefore the question arises, whether the rehabilitation of sugar factories in Java is desirable. And if so, in what form and to what extent.

To answer these questions the following points should be considered.

Most problems concerning land, labour and the derelict state of the factories could be solved by permitting the factories to fix a remunerative sugar price. Then, in turn, they could pay higher land rents (and select good soils), higher wages (and attract better workers), and from the profits it would be possible to replace at least part of their equipment. But it may be questionable, whether the funds needed for such a rehabilitation could not be better used for other purposes.

The following macro- and micro-economic analyses attempt to assess this point. Though they are only crude, because in several respects no sufficient information is available, they may broadly demonstrate the general considerations that play a role in making a decision in such cases.

The appraisal of an agricultural project can be made at different levels: whether the individual farmer benefits from the project, whether the agency which undertakes its financing receives a reasonable enumeration, or whether it is sufficiently attractive from a national standpoint. The present analysis concerns only the economic evaluation of the project at a national level.

Various methods can be used to determine whether a project is economically justified in view of possible alternatives uses of the involved inputs. Though the author realizes the limitations and shortcomings of the capital-output-method, he had to use this technique because of lack of detailed information. According to this method, the incremental capital output ratio is defined as the ratio of increment of capital 'investment' to increment in output. In 'capital' are included the investments for reconstructing the factories and for training personnel. To measure the increment in output, use could be made of the expected increase of sugar production resulting from the rehabilitation of the sugar factories.

The foreign exchange costs for rehabilitating the 54 sugar factories is estimated at about US $ 54 million.[189] Rupiah expenditures would be required for unloading, transport and installation; though they are rather substantial they are low as compared with the above mentioned amount and can be estimated on 10%, or in dollars at

[188] People's Consultative Congress, *Ringkasan Ketetapan MPRS.*, I dan II, 1960, p. 203, and ECAFE, *Economic survey of Asia and the Far East 1964*, p. 166. This figure of $ 8,500,000 is also supported by Professor JOOSTEN as, according to him, the cost of constructing one factory with the annual capacity of 30,000 tons will amount to about 30 million guilders.

[189] The data on which these calculations were based are from a discussion with Mr. SOSRO MOELJONO (See also ECAFE, *op. cit., fn.* 188, p. 166).

5.4 million. So the total cost amounts to $ 59.4 million.[190]

To meet the shortage of skilled personnel a training program has to be set up. It must be placed on a rotational basis as it is impossible to send away a great number of persons simultaneously without disturbing the present production. All ranks should be involved, from specialized labourers to leading functionaries; as to the latter, it probably cannot be avoided to send some of them abroad. Assuming that over a period of ten years each year one tenth of the personnel is temporarily withdrawn from the factoriess this will cost (with the current staff of 2500) about $ 750,000.[191] The remaining staff will be trained in the country for a period of six months; this will cost the government $ 750,000 plus Rp 270,000,000, or, at the dollar rate in 1962 together about $ 2,000,000.[192]

The total rehabilitation cost will thus be $ 61,400,000.

The benefits expected from this rehabilitation program, estimated at a 10% increase (see Tables 98 and 100) in the current production of 700,000 tons amount to about 70 000 tons annually if the present delivery of cane can be maintained. This means at world market prices varying between $ 40 and $ 160 per ton, an output ratio between 5.5 and 21.9, depending on the price of the sugar at the world market (see Table 111).

From the above evidence we can conclude that economically the rehabilitation of sugar factories does not seem as justified as is generally believed.[193]

Next it might be argued that it would be much better if the amount of $ 61.4 million needed for the rehabilitation of the factories were invested in, for examples the replanting of rubber trees. The Economic Survey Team of the U.S. estimated in 1962 that this cost totalled about $ 45 million during a period of ten years. It involves an additional rubber export earning for Indonesia somewhere between $ 260 and $ 430 million a year. In addition, the export prospects are much better than for sugar and the government has to undertake a replanting program as otherwise other cheap natural or synthetic rubber producers will gradually squeeze out Indonesia's increasingly inefficient and costly production.[194]

On the other hand it has to be realized, that the investment in rubber production will primarily be to the benefit of the Outer Islands, thus leaving Java's problem still unsolved. Therefore, although rehabilitating sugar factories in Java will be only profitable with high sugar prices, the government cannot escape the need to rehabilitate some of the factories, if she wishes to avoid as much as possible importing sugar from abroad, as it is doubtful whether the Outer Provinces will ever become an important sugar producing area.

[190] The estimate of the rupiah cost was based on the experience of the author when he was Project Director of the Development Project Consulting Service in Indonesia between 1962 and 1964.

[191] Based on the estimate of the Department of Higher Learning and Science, *MPRS Report 1963*, p. 9.

[192] *Ibid.*

[193] Actually a return in 5.5 years does not appear too bad.

[194] US GOVERNMENT, *op. cit.* (*fn.* 27), pp. 39, 69, 213–220 and appendix 44.

At present the cost for rehabilitating the machinery, using as much as possible local materials in replacing some of the worn-out equipment, is much lower than would be the cost of reconstruction of the whole factory. Of course, at the end of the period, there is a need for a large scale replacement of the worn-out machines, but in the meantime, the government should make a technical and economical survey to justify the construction of new factories. For example, in a place where there is a cluster of sugar factories but not enough cane is available, some of them must be closed or transformed into other kinds of factories. Personnel of the reconstructed factories should be trained how to handle the new types of machines. There must be certainty about the availability of fertile soils and other complementary factors to make an investment in new factories attractive.

In recent years, annual sugar production has fluctuated between 600,000 and 800,000 tons. Domestic consumption at 'fair' price levels might well be 1,000,000 tons for the whole of Indonesia, but at the moment this goal seems to be beyond reality because of transport difficulties and high production costs. In addition it could be argued that, even if it were economically justified to induce a *per capita* sugar consumption level twice that of the prewar period, sugar has still to be considered a luxury under the present economic situation in Indonesia.

Thus, whether the government prefers to have a larger export or to rise the domestic consumption (to increase the number of calories available for the population), it is evident that in both cases sugar production should be increased. However, as regards the rehabilitation of the factories it should be clear from the preceding discussion that there is no decisive test as to whether the benefits of the project are sufficient to warrant its implementation.[195] It may be that the agro-economic survey which is being carried out in Indonesia will further analyse this important subject and can give a better founded recommendation.

Table 111. Estimation of capital output ratio for the rehabilitation of the sugar factories at various sugar prices.

Increase of production in tons	Price levels in US $ per ton	Increase of revenues in US $	Estimated investments, including training program in US $	Estimated capital output ratio = (4):(3)
(1)	(2)	(3)	(4)	(5)
70,000	40	2,800,000	61,400,000	21.9
70,000	80	5,600,000	61,400,000	10.9
70,000	160	11,200,000	61,400,000	5.5

[195] The author is more inclined to conclude that it is not profitable to rehabilitate the sugar factories in Java except with high world sugar prices.

8.8 Potential of peasant cane growing

Viewed from the micro-economic standpoint there are three possibilities for the cane grower to use his agricultural resources, namely:

(a) to cultivate crops other than cane, for instance rice and dry season crops;
(b) to cultivate cane and either sell it to the factory or process brown sugar himself;
(c) to rent his land to the factory and to work there at the same time or to seek other employment elsewhere.

Due to lack of detailed economic data it is difficult to state exactly which of these above possibilities will be most beneficial to the peasant. However, something can be said about the possible decisions and choices of the peasants, based on the rough calculation summarized in Table 112.

From these figures it could be concluded that cane growing will be the least profitable. In the case of working at the factory there is the advantage that the peasant's wife might contribute to the family's income by being herself employed there, while in the other two alternatives she will help her husband in his farm business. Assuming that she will work half of the time and the wage paid by the sugar factory is 2/3 of that of her husband, there will be an additional income of Rp 2400. But it must be kept in mind that in the year 1960 the wages paid to the workers were relatively high due to the monetary reform of late 1959. As, since then, inflation proceeded, this alternative will be less favourable, especially as the peasant has to buy additional food for his family, the food he receives from the factory being insufficient.[196] Nevertheless, under the present circumstances the non-cane peasant seems to be the best off.

Now the question arises, under what circumstances will the growing of sugarcane be favourable for the peasant? To answer this question it has to be remembered that a farm's gross income depends on the yield and the price of the crop. Usually the total yield of a particular crop will not change much in a short time, so that the farmer's income chiefly depends on prices. Price changes serve as a mechanism whereby consumers indicate a certain preference and this causes shifts in production and use of resources, unless measures are taken to direct the production pattern and the use of the resources. In this case the regulations must be made effective. Given a free choice, the farmer will cultivate the crop that seems the most profitable to him. Assuming that:

(a) the non-cane peasant earns during the 18 months with rice and other crops twice the value of a sugar crop;
(b) the average rice yield is 20 quintals/ha with a price rice of x Rp;
(c) the yield of peasant cane is 600 quintals/ha or 60 quintals of sugar/ha with sugar prices of y Rp and a cane price 4% of the sugar price;
(d) the main difference between production cost of the two alternatives, excluding the processing of the products, is the fertilization cost which in 1960 was estimated at Rp 2000 per ha.

[196] Payment in kind has not increased after 1961.

Then we come to the following equation where rice production is as profitable as cane growing:

$$(2.20x)-500=600\,(0.04y)-200$$
$$y=(1.6x+62.50)\text{ Rp per 100 kg sugar.}$$

This means that cane growing is as profitable as rice growing if the sugar price per kg is fixed at 1.6 times that of rice plus the fertilization costs. In 1960 however, the sugar price was Rp 4.65, while the rice price was Rp 7.75. Therefore it is evident why the peasant shifted from cane to rice growing.[197]

So much for cane and rice growing. Some of the sugar fields are also suited for tobacco and, in the Cheribon area, also for the cultivation of onions. The question arises then which crops are more profitable to cultivate. Since there are no farm management data on which to base his recommendation, the author could only suggest that the decision should be based on three criteria:

(a) which crop will give the biggest net added value to national income?
(b) which crop will provide the most employment opportunities?
(c) which crop will give the peasants the highest income?

More detailed farm management studies should help the farmers, and the government to make a choice for the efficient utilization of the available but limited farm resources.

From the rough micro-economic analysis as given in the foregoing pages, the conclusion is that sugarcane growing is not so profitable for the peasants as it is generally believed, or to put it in a more general way: it is economically not justified to allocate, in advance, a certain percentage of agricultural land for a certain crop as done up to now in the case with sugar cultivation in Java.[198]

Table 112. Estimated annual income of landowners per ha by type of occupation, Java, 1960.

	Income in Rps
Non-cane peasant	15,500
Cane-peasant	6,000–8,000
Non-peasant	11,000

[197] Of course a new exchange rate might change the situation.
[198] See also D. H. PENNY, The economics of peasants agriculture: The Indonesian case, *Bull. Indon. Econ. Stud. 5*, Canberra, October 1966, pp. 26–31.

9 Improvement of peasant's agriculture, especially rice growing

As mentioned before, peasant agriculture is the backbone of Java's economy. The foregoing chapters have reviewed its main aspects in the past; this chapter is intended to deal more elaborately with the various factors affecting its present production.

The range of factors influencing the progress of agriculture is very wide. They can be arranged in different ways, but here the classification given by the Conference on Productivity and Innovation in Agriculture in the Underdeveloped Countries, held at Cambridge, USA, in January 1965, will be followed[199]. It distinguishes between:

(1) the physical input
(2) the economic environment
(3) research and education
(4) organizing agricultural development.

Some factors which affect peasants' agriculture will be discussed more elaborately than the others, as they are almost intermediate in their effects. Attention will primarily be given to rice, being the main crop in Java.

9.1 The physical input

To raise the volume of peasants' agricultural production in Java, the physical input should be increased. The major requirements are:

(1) To develop an efficient fertilizer program.
(2) To construct new irrigation works, to improve the existing irrigation system and to regulate water supply.
(3) To select high-producing varieties suitable for different soil, climate and water conditions, and to increase the use of such varieties.
(4) To control pests and diseases.

[199] Another classification is given by BARTER (based on the FAO/ECAFE Report on Selective aspects of agricultural planning for the Far East; see also FAO, Agricultural planning studies No. 3, 1963, p. 173) who separates the various means by which the governments can influence the rate and pattern of agricultural development as follows:
(1) Provision of material impuls, e.g. fertilizers, improved seeds, and irrigation.
(2) Measures to improve efficiency, e.g. research and extension.
(3) Provision of economic incentives, e.g. price support and crop insurance.
(4) Institutional reforms, e.g. land reforms, provision of institutional credit, reform of marketing system, cooperative services and farming.

(5) To improve cultivation methods by the use of more efficient implements and better cropping patterns, including the use of green manure crops.

As compared with other means of increasing production, the more extensive application of fertilizers seems to be most promising as can be seen from the following section.

9.1.1 The use of fertilizers

The average quantity of fertilizers used (primarily in Java) during the years 1936–1941 was 122,700 tons. During the period 1947–1952 it decreased to 53,000 tons (Table 113)[200]. The import in later years varied considerably, but between 1958 and 1963 there was a distinct trend for higher figures[201]. As Indonesia itself did not produce large quantities, this means that fertilizers were used only on a very small scale as compared with other countries of the ECAFE region. While in Java during the period 1962–1963 the applied quantity was only 8.5 kg per hectare, in Japan it amounted to 270 kg, in Taiwan to 190 kg, in Korea to 175 kg[202].

In the past, the estates were the principal buyers; among them the sugar estates ranked first. The peasants used only small amounts, mainly for cash crops such as sugarcane, tobacco, onions, red pepper and cabbage, sometimes on irrigated rice fields. Although good results can also be expected for padi gogo, maize and other foodcrops by fertilizing with N, P_2O_5 and possibly K_2O (especially on soils in good physical condition), they were practically never applied.

Table 114 gives the amounts of fertilizers recommended by the Extension Service in 1953.[203]

Since the Rice Selfsupporting Campaign (SSB.) was launched in 1959, the use of fertilizers by the peasants has increased considerably, as can be seen from Table 115. More than 60% of the fertilizers was intended for use by the peasants. Provision for the food crops surpasses the requirements for estate crops, which formerly consumed most of the fertilizers.

In 1962, about 300,000 tons of fertilizers were imported to increase rice production. That year a rise of 10% was noticed as compared with the average over 1953 to

[200] SIE KWAT SOEN, The Use of Fertilizers in Indonesia, *Ekonomi dan Keuangan 7*, 1954, p. 614.

[201] Imports are considered to be interchangeable with consumption figures until 1963. Before the war there was an average domestic production of 40,000 tons of rock phosphate. After the war production was in operation again the middle of 1953, but since then dropped till 9,000 tons annually. Starting from 1964, the urea plant in Palembang (South Sumatra) started its production at a potential capacity of 100,000 tons annually.

[202] This is the average figure for the whole of Indonesia. For Java it is somewhat higher, since fertilizers are primary used on this island (see UN, *Economic Bulletin for Asia and the Far East 16*, No. 1, June 1965, p. 22).

[203] SIE KWAT SOEN, *op. cit.* (*fn.* 200), p. 604.

1962.[204] But in the year 1962, the weather conditions were very favourable and many agricultural experts attributed the increase primarily to the good weather. Factors such as climate, soil fertility, nature of the crops and education of farmers are important aspects in the use of fertilizers. Besides, economic considerations such as the cost of fertilizers and the extra labour needed to apply them play a role.

Despite the research results of MAHAN and others, many farmers hesitate to use fertilizers. Their reluctance could be explained by the fact that MAHAN's figures are averages based on field studies of the Agricultural Experimental Station in Bogor. Whether the same results could be obtained on a large scale is still debatable, and it is possible that an individual farmer has no results. In view of his weak economic position he hesitates to take any risks.[205]

Table 113. Imports of fertilizers (in 1000 kg) in Indonesia, 1936–1941, 1947–1952, 1958–1964.

1936–1941, average	122,700	1960	228,300
1947–1952, average	53,000	1961	346,400
		1962	446,800
1958	157,000	1963	375,400
1959	254,600	1964	169,400

For the period 1953–1957 no reliable statistics are available.

Source: *Statistical pocketbook of Indonesia 1963*, p. 135, and *Warta Biro Pusat Statistik* (Bulletins of Central Bureau of Statistics), December 1966, pp. 18–20.

Table 114. Necessary quantities of ammonnium sulphate for peasant agriculture in Java, calculated on 200 kg/ha.

	Area in ha	Quantity in 1000 kg
tobacco	60,000	12,000
pepper	2,000	400
sugarcane	35,000	7,000
potatoes	8,000	1,600
onions	5,000	1,000
vegetables	10,000	2,000
maize	5,000[2]	500
chillies	10,000	2,000
total		26,500
other crops		3,500
all crops		30,000[1]

[1] 30,000 tons of ammonium sulphate makes 6,300 tons of N. [2] 100 kg/ha.

Source: Sie Kwat Soen, The use of fertilizers in Indonesia, *Ekonomi dan Keuangan 7 (9)*, 1954, p. 604.

[204] *Statistical pocketbook of Indonesia 1963*, p. 135. The total import of fertilizers in 1961 and 1962 was 350,000 and 450,000 tons, respectively or about 400,000 tons a year, of which 70% was used for rice (MAHAN, see footnote Table 74, pp. 68–70). See further, Central Bureau of Statistics (CBS), *Produksi-Bahan Makanan Utama di Indonesia 1963*, Djakarta 1965, p. 1.

[205] Professor JOOSTEN is of the opinion that unless there is an expanding market for the farmers' produce there is little sense to expand production, especially if the fertilizers are imported.

Table 115. Fertilizers: import plans for 1962–1963, and destination (in metric tons of plant nutrient), Indonesia.

	N	P_2O_5	K_2O
Agricultural Extension Service:			
paddy	7,294	8,754	
maize		15	
fruits and vegetables	12,489	7,685	589
small farmers' commercial crops	6,282	826	
Agricultural State Enterprises (BPU Pertani):			
paddy centers	88,261	56,391	
upland rice	196	505	600
Government estates (PPN)	22,871	10,069	4,366
Private estates (Swasta)	492	3,898	679
Total	137,885	88,143	6,252
equivalent to	306,400	232,000	10,420
	urea	superphos-phate	potasiium chloride

Source: MAHAN, *op.cit.* (fn. Table 74), p. 70.

Table 116. Irrigation projects included in the Indonesian Overall Development Plan, 1961–1969.

		ha	ha
1961	Rehabilitation of tertiary irrigation system in Java and South Sumatra		63,700
1962	Ibid. in Java	17,500	
	Section I Djatiluhur project in Java	80,000	97,500
1963	Section II Djatiluhur project in Java	80,000	
	Rehabilitation secondary and tertiary system in Java	12,600	
	Rehabilitation outside Java	40,000	132,600
1964	Water reservoir in Java	5,000	
	Section III Djatiluhur project in Java	80,000	85,000
1965	New projects in West Sumatra and South Celebes	401,000	401,000
1966	–		
1967	New projects in South Sumatra	85,100	85,100
1968	Rehabilitation in Java	90,932	
	New projects in North Sumatra	297,000	387,932
Total			1,252,832

Source: National Planning Council (Depernas) as cited by MAHAN, p. 62 (see Table 115).

Convincing farmers of the advantages of fertilizers is a slow process. Especially where the government made some mistake, as was the case when, after World War II, the KOGAM (the Kommando Operasi Gerakan Makmur, the Welfare Operation Command) distrubuted urea in certain parts of south-eastern West Java without the support of adequate soil and field research data. The results was: no increase in production, and for the time being the farmer in that area hesitates to use fertilizer.

There were times when a part of the fertilizers, which were supposed to be applied to rice, was used for sugarcane, tobacco, etc. Perhaps this was economically justified, as the result was indeed a higher return, but the aim to increase rice production was not reached.[206]

Despite the many problems which still have to be solved, the author is of the opinion that properly applied fertilizers are economically justified if their application is combined with fighting diseases, proper irrigation and the use of improved seed. Then Java would be able to raise enough food to feed its people.

9.1.2 Irrigation

Java, Bali and some parts of the other Indonesian islands are of old renown for their irrigation system. Its advantages have so often been brought to the fore that further elaboration seems superfluous.

Java and Madura account for about 63% of the irrigated land, as can be seen from table 36 under 3. This has resulted in a high occupation value of the soil, reaching 118 in 1941. But after this year it hardly increased anymore, as the establishment of smaller irrigation works was economically justified, only after large ones had been constructed.

The National Overall Development Plan 1961–1969 gives a program for repair and improvement of the existing systems and the construction of a number of medium sized and a few large projects for the whole of Indonesia. Its execution will add a total of 1,252,800 ha, as can be seen from Table 116. Only part of it refers to Java: the Djatiluhur Project, the Tjimanuk Development Scheme, and the Brantas Project.

The Djatiluhur Project will add 180,000 ha; its costs will amount to 5,000 million rupiahs. Spending this amount seems hardly justified from an agricultural standpoint, but actually the generation of power is the main aim of this project. Its completion will cost the government a total of Rp 2,500,000,000 for power generation, of which 50% or about $ 110 million will be in foreign exchange, and another Rp 2,500,000,000 for irrigation purposes of which no foreign exchange component is given.[207] It is expected to produce about 216,000 tons of rice annually, just enough to feed the increase of Java's population in two years. It took ten years to build and was completed in 1967.[208]

[206] Sugar was in this example more profitable than rice because it was sold at the free market price in contradiction to the example given in Chapter 8.

[207] MPRS, *op. cit.* (*fn.* 191), pp. 192 and 199. Conversion rate of: 1 $=Rp 11.40.

[208] Average yield of 1 ha is estimated at 1.2 ton rice.

Also in the Brantas Project power generation and flood control are the main purposes. The Tjimanuk Development Scheme is still in the planning stage.

Irrigation agriculture is considered to be the most productive kind of farming devised by man, but in the short run it is also the most expensive.[209] The cost of building irrigation works as part of the multipurpose project is calculated at Rp 11,500 per ha, equivalent to US $ 115.[210] In this figure is not included the cost of building the main and secondary canals. To maintain the high yield required by the high cost of irrigation, again all other physical inputs like fertilizers, improved seeds, pest and disease control, and other improved farm practices must be used to full advantage.[211]

9.1.3 Improved seeds[212]

As indicated earlier, before World War II the government had already developed some superior varieties of rice crops.[213] It was estimated that already about 1,000,000 hectares were planted with these seeds. The most widely used varieties were 'Tjina' and 'Begawan'. During the Japanese occupation (1942–1945), the area with improved seeds declined substantially.[214] This may be explained by the fact that these varieties require a somewhat different treatment and that they are more difficult to handle than the plants from common seed.

After World War II, the Ministry of Agriculture launched a number of projects to restore the use of improved seeds. With the help of the Institute of Rice Research at Bogor, the prewar varieties of high yielding seeds were reproduced and new ones were developed. These seeds were sent to the regional experimental farms of the Institute of Rice Research where they formed the initial stocks for multiplication. Thereafter, under the guidance of the Agricultural Extension Service, the seed was transferred to selected good farmers for further multiplication. Finally the new seeds were distributed amongst the individual farmers.

In addition to the 'Begawan' varieties, new improved seeds like 'Gadis', 'Remadja', and 'Djelita' have been introduced. The area planted with improved seeds amounted in 1962 to about 2,000,000 ha.[215]

[209] PELZER has stated that the construction of technical irrigation systems required an average investment of 190 guilders or about $ 100 per ha before World War II. PELZER, *op. cit.* (*fn.* 52), p. 55.

[210] Since a substantial part of building the dam is imposed on the cost of the power generation, the irrigation cost is less than it should be. For instance, according to GROENVELD, the average cost of irrigation projects, using a high dam, but in which only the main canals are included in the public costs, is between $ 750 and $ 1000 per ha (D. GROENVELD, *Investment for food*, Amsterdam, 1961, p. 85.

[211] Before the war the government had already introduced the use of improved seeds on irrigated field, to increase rice production.

[213] Actually the right term is improved quality of superior seeds. For convenience the term improved seeds is used here, as usually done in other publications.

[214] Improved varieties are usually superior in selected characteristics and their ecological adaption tends to be relatively limited.

In 1960 a Japanese research team which came to Indonesia noticed that the Indonesian rice varieties are quickly 'saturized' with nitrogen. The plants tend to lie down if too much fertilizer of this kind is used, which results in loss of kernels. The Japanese experts thus recommended to look for new varieties which can stand a heavier nitrogen fertilization (e.g. the Japonica rice type) for further breeding purposes. In addition, varieties are produced suitable for dry cultivation ('Gadjali-lampung') and for the tidal swamps ('Bajar-kuning').[216]

The use of improved seeds will also be very important for the production of maize, especially in combination with fertilizers. It has been proved that the application of 100 kg of urea per hectare may increase the production from about 1000 kg/ha to 3000 kg. In the long run, hybrid maize will give considerable possibilities: a yield of 8000 to 9000 kg/ha is considered possible.[217] But the implementation of a program which aims at such improvements requires some education of the farmers, a goal which cannot be accomplished overnight.

9.1.4 Pest and disease control

In the prewar period, the government already issued regulations against pests and diseases. With the establishment of central and local agricultural experiment stations, the systematic study of diseases and pests could start, and measures could be taken to combat the damage. As the occurrence of plagues is closely connected with climatic conditions, a theoretical study of data from the past made a fairly precise forecast possible.

Since World War II, the prewar regulations for pest and disease prevention have been in many respects neglected. Some of them were considered politically unacceptable, though technically beneficial. For example, to diminish the risk of losses caused by rats it is required to keep to certain rules such as the simultaneous planting of rice at a prescribed time so that during a sufficiently long period no food is available for the animals. But as the farmers were unwilling to follow these measures, and the government (because of political reasons) could not force them to do so, the result was an explosion of rats. There are of course other measures, such as the use of pesticides, but for the time being, planting time regulations seem to be the most effective and cheapest way out.

A study of the use of pesticides may be more important in the future because they

[214] The exact figures are not available, but it is estimated that it dropped to a very low number of 100,000 ha.

[215] MPRS, *op. cit.* (*fn.* 191), p. 5, and MPRS, *Ichtisar Tahunan 1961 dan 1962*, Djakarta 1963, p. 57.

[216] The use of improved seeds is a very important means of increasing production. For instance, the research institutions before World War II won golden opinion by the improvements made in agricultural export. The yield per hectare of rubber, sugarcane and other crops was the highest in the world.

[217] MPRS, *Ichtisar Tahunan 1961 dan 1962*, Djakarta, 1963, p. 57. Dr. MAHAN even mentions a production of 3000 kg by an application of 1 qt urea (personal communication).

Table 117. Use of some pesticides in Indonesia (in tons), 1950, 1961.

	Arsenicals	Benzene hexachloride	Sulphur compounds	DDT	Copper compounds
1950	550	10	250	85	350
1961	200[1]	295	300[2]	168	1273

[1] For 1960.
[2] Dusts.

Source: ECAFE, Economic survey of Asia and the Far East 1964, p. 111.

will interact strongly with other inputs in the later stages of agricultural development. The need for pesticides rises as development proceeds, because other inputs often create conditions that favour the spread of diseases and pests.[218]

At the present time, a pest-control program must still be carried out under close supervision of the officials of the Ministry of Agriculture because many of them are poisonous and most of the farmers cannot properly read the warnings attached to the packages.

For a succesfull execution of the pest and disease control program all farmers must be coerced to join it. They must receive instructions in plant protection measures, such as changes in sowing dates, cultural practices, seed treatment and appropriate crop rotations[219], breeding crop varieties of rice, maize, etc. with the highest resistance to diseases, and the proper use of fungicides and pesticides.

9.1.5 Other improved agricultural practices

Productivity of land is not only a function of soil and climate, but also of the technical level in agriculture. With the adoption of improved cultural practices such as a wider use of green manure crops, better soil conservation measures, the introduction of new crops, a better crop rotation and mechanization and other practices mentioned earlier, there is technically still scope for considerable improvements in Java.

The use of green manure crops introduced to the farmers before World War II, proved to be most promising to increase the production. It was estimated that 300,000 ha of the peasant agriculture area were covered with them.[220] Mostly *Crotalaria*

[218] Data on the use of these chemicals are inadequate, but available information is summarized in table 117.

[219] These are some of the operations of which the farmer has to be mindful of the right time to counteract the adverse effect of some major diseases and pests.

[220] SIE KWAT SOEN, *op. cit. (fn.* 200), p. 606 *et sqq.* Green manuring is also important for estate crops like tea, coffee, etc. There are no data available about the total acreage used in these plantations.

juncea is used; under certain conditions 100 qt/ha may replace 1 qt/ha ammonium sulphate.[221]

Though no exact data are available, it is certain that during and immediately after World War II the use of green manuring has dropped. Among others, this is due to the financial difficulties the peasants met. In addition they were eager to have a continuous production of their land to have more cash and they lost sight of the fact that in the long run this would be detrimental to the yield.

Green manure crops can also be used for soil conservation purposes, e.g. along terraces. Sometimes the slopes of agricultural land are covered by leguminous and other soil protecting crops, though mountain areas should be kept under forest. These are all measures necessary for soil conservation, because once erosion occurs, as e.g. in the Gunung Kidul area in Jogjakarta, it will take hundreds of years to regain the top soil by reforestation.

With the introduction of new crops, with the growth of the towns, the increasing industrialization and the gradual rise in national income, there may be a marked trend towards a more 'western' type of diet. There will be a higher demand for foods such as fats, fruits, vegetables and livestock products. For this reason, the Agricultural Extension Service is encouraging the so-called 'compound cultivation', i.e. planting vegetables, fruit trees, tuberous plants and other products around the houses in the villages.

Some efforts are also being made to integrate the development of crops with an expanded production of livestock. By this means animal residues can be returned to the soil and consequently increase the production. This joint food and fodder crop agriculture is a promising line for better crop rotation.

After the war mechanization of agriculture was introduced by the government to increase production. But the introduction of motor-powered machinery might create problems: in Java, with its surplus of labour in agriculture, mechanization might aggravate the problem of unemployment or underemployment.[222]

9.2 The economic environment

It is generally believed that the physical input factors are the strategic ones to promote agricultural production. Neverheless, it appears that in many cases where the available supplies of irrigation water and other requirements have not been considered, or where fertilizers have not been properly used by the farmers, the impact of government measures on production is much less than had been expected. Lack of economic

[221] *Ibid.*

[222] For the reclamation of new agricultural land in the Outer Islands, where there is a more favourable land/labor ratio, there are possibilities in the use of farm machinery. Perhaps in the long run agricultural mechanization could play a strategic role in agricultural development in the Outer Islands, especially if combined with agricultural resettlement in the scope of regional economic development. See also Chapter 7.

incentives is one of the main factors why farmers are not eager to use more improved requisites. Therefore, the government should pay more attention to create a favourable economic environment. The following pages will describe some aspects of economic incentives: the price policy, the marketing incentives, the credit policy, and the incentives to be expected from land reform and changes in the size of holding.

9.2.1 Price policy

The prices received by farmers for their products determine the use of fertilizers and other improved requisites. Instability or fluctuation in prices cause the expected increase in the value of the harvested crop not to cover the cost of fertilizers.

It is difficult to estimate the extent to which price policy affects agricultural production in Java. Inflation has been more or less continuous since 1952, and it is hardly possible to choose a proper deflator in order to isolate the price influence on agricultural production. But something can be said about the effect of the applied price policies on production in general.

Maximum prices for basic agricultural commodities are fixed by the government; they are usually relatively low. A special administrative machinery is set up to control them; but it is inadequate and hardly works. If a price level has become unrealistically low this may become fatal to maintain it.[223] While there is a shortage of goods and serious inflation occurs, fixed prices will not have any reasonable chance of success.

Thus it is clear that the relatively low price paid to the peasants by the government before 1964 for their rice did not increase their output. Both the area devoted to rice and the yield per hectare tended to fall, as illustrated by Tables 57 and 58 in Chapter 4.[224]

To induce the farmers to sell their rice, the government resorted to a so-called non-price measures policy, which means subsidizing fertilizer distribution, equipment, etc. It should be realized, however, that even if the non-price measures succeed in encouraging the farmers to increase their production, the amount of rice which they are willing to sell to the government will be below expectation. As long as the government has difficulty in obtaining a domestic market surplus for subsidized distribution, it will be forced to import rice from abroad, or to persuade the people to shift to other carbohydrate resources.

In August 1964, in order to encourage domestic production, the government commenced to buy rice at the free market price and abandoned its low price purchasing policy. But on the other hand, the government had to sell the rice at a subsidized price, for example to its officials, thus increasing subsidy costs. Indeed, the government faces a difficult task in finding a reasonable price for both producers and consumers.

[223] P. G. H. BARTER, Agricultural price policies and economic incentives, in FAO, *Agricultural Planning Studies*, no. 3, FAO, Rome 1963, p. 210.
[224] *Statistical pocketbook of Indonesia 1963*, pp. 68–70.

Regarding the farmers' export crops, we face another serious problem. The discrepancy between the free market and the legal prices gives rise to smuggling, under-invoicing of exports. It is difficult for the state trading enterprises to procure goods from private producers because they have to purchase the goods against fixed, usually low, government prices. Moreover, these manipulations cause a substantial volume of foreign exchange to go into non-official hands.

9.2.2 Marketing incentives

The author fully agrees with the conclusion of the Conference on Productivity and Innovation in Agriculture in the Underdeveloped Countries, which has stated: "Market reform ought to be an integral part of any policy for agricultural development. Normal economic incentives to induce farmers to increase productivity can operate only to the extent that the marketing system enlarges the market for their produce and brings them a reasonable price for it. Their desire to earn larger cash incomes can be stimulated by a marketing system that brings them cheap consumer goods, and their effort to increase productivity can succeed only to the extent that the marketing system delivers the needed inputs. Marketing is as critical to better performance in agriculture as farming itself and should be regarded and developed as such".[225]

JOOSTEN has also stressed that agricultural development is primarily a structural problem, that establishing a market for the farmer's produce is equally important as, e.g., capital investment.[226]

Farming in Java usually means more or less self-sufficiency in food and is not highly commercial as in more developed countries. The quantity of marketable surpluses depends largely on the size of the consumption of the farmers themselves. For example, the proportion of the marketed surplus is estimated at about 30% of the rice production. The government has tried to increase the flow of supplies of agricultural products to the urban markets to meet the increasing demand there, but not always with success. Indeed the lack of incentive to higher production can be attributed for a considerable part to poor marketing facilities,[227] and an expanding market for the peasant's produce will solve most of the problems for increasing production.[228]

The rural market system in Java has been profoundly influenced by the opening of the country to the world market. Yet it has retained an identity which separates it from

[225] Conference Report, p. 80.

[226] J. H. L. JOOSTEN, Landbouwontwikkeling en macro-economische orde. *Landbouwk. Tijdschr. 76*, 1964, pp. 122–124.

[227] Other impeding factors for increasing production are, for example, transport facilities, credit policy of the private moneylenders.

[228] Professor JOOSTEN has always stressed that lack of markets is one of the impeding factors for increasing peasants' agriculture. An expanding market will occur if the non-agricultural sectors will also expand (see the section on fertilizers under 9.1.1.).

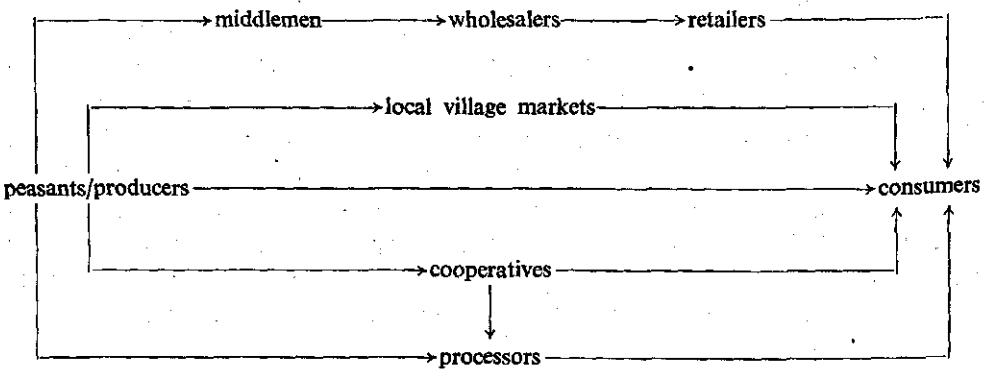
many of the features of the complex world of international business.[229]

MEARS[230] made a good start in the study of this subject with his publications on rice marketing in Indonesia. But in general, data regarding the marketing of peasants' agricultural produce and the channels which are followed in this process are very scanty. Therefore it is impossible to say anything precise about this subject and the discussion has to be restricted to a few remarks.

The farmer may dispose of his product by selling it to the local merchant or dealer-processor-shipper or directly to the consumer, or he may sell it to the marketing cooperatives society if it exists in his village, From these three marketing systems, the first is the most important. It is in this sphere of assembling and distribution of farm products in Java that a number of middlemen have emerged. The accompanying diagram depicts in a general picture the position of these middlemen, their mutual relations, and their connections with the farmers. It also shows that agricultural markets in Java can be classified into three categories: village or primary markets, assembling or secondary markets, and distribution or terminal markets.

It may be more advantageous for the farmer to sell his products to the consumers at the village market, whether he does, or does not, depends largely upon the distance from his home to the village, the means of transport and the volume of the products to be sold.

Diagram for domestic marketing channels of agricultural products in Indonesia.



The process of assembling agricultural products from numerous small-scale producers and distributing them to Java's sixty-three million inhabitants is very intricate and expensive.[231] Before the products reach the consumer they pass various markets,

[229] Since this chapter is concerned with farmers' agriculture, the marketing of estate agriculture products will not be discussed here.

[230] See LEON A. MEARS, *Rice marketing in Indonesia*, plus *supplement*, Djakarta, 1961.

[231] Lack of adequate transport facilities also contributes to the high marketing cost of the products.

either before or after processing, and they enter through different channels. The middlemen are mostly Chinese, but (especially in the last years) also Indonesian traders. They perform a combination of services: they act as brokers, warehouse men, processors and also as 'bankers' who finance the local crop production. This all adds up to a complex and expensive system.[232]

Obviously the existence of so many types of middlemen is detrimental to the price the farmer receives for his product. But as long as no sufficiently regulated markets are established and cooperative efforts on the part of the farmers themselves remain inadequate, the presence of so many middlemen is necessary. The government considers no other approach as effective in eliminating the role of middlemen as promoting the cooperative marketing system, where a combination with credit supplies is essential. But the establishment of an efficiently operating cooperative is not an easy task.

9.2.3 Credit policy

According to the government, permanent indebtedness causes the farmer to lose his self-reliance and the will to take his fate into his own hands or to raise his low level of prosperity. Therefore, the government has established many institutions to provide 'cheap' credit to the peasants as will be shown in the section dealing with credit-institutions. Although the government has established many credit agencies and cooperatives (the so-called institutional credit agencies), yet they still are relatively weak in comparison with the private moneylenders or the non-institutional agencies. These moneylenders are estimated to provide about 80% of the farmers' need and usually charge much higher interest rates than those fixed by the government.[233] For the time being they still are indispensable, because private loans are easier to get, even for consumption, and usually are 'unlimited'. Often those agencies give credit without any security to people they know.

On the other hand, governmental funds are limited: not more than 20% of the total credit required by the farmers is available from this source. Besides, loans are given only for specific purposes, and on condition that the farmer provides for collateral security to back his application. Administrative practices discourage the simple farmer from borrowing.[234]

The government argues that it is necessary to find a way to solve the peasant's need for credit. It must gain the peasant's confidence, act as a protector and promote the farmer's welfare in regard to his product. With a more efficient organizational setup and emphasis on the technical improvement associated with credit, it must rouse

[232] C. S. BELLSHAW, *Traditional exchange and modern markets*, New York, 1965, pp. 67–68.

[233] This was the situation before the SBB campaign in 1959, when the government provided to every farmer a basis of Rp 1000 per ha, partly in kind (like fertilizers). After 1959 the government's share has increased.

[234] See footnote 233.

the peasant's spirit and give back his creativeness, which is the basis for agricultural development.

What organizational setup will be the best to carry out is illustrated under 9.4.

9.2.4 Land reform and size of holding

As indicated in the discussion of the distribution of farms by size, in 1963 about 85% of the farms in Java were under one hectare. Of this number, about 70% had an area below half a hectare.[235]

A heavy population pressure on scarce land brings about keen competition for the right to cultivate a plot of land. Therefore, high rents are common. Rents are of either fixed on a certain amount, regardless of the harvest, or they are of the crop sharing type. Share-cropping is the prevalent tenancy in many areas in Java (for further particulars see under 5).

In 1960 the Indonesian government enacted the Land Reform Law, better known under the name Basic Agrarian Law no. 5, which contains the basic regulations of various landrights, the tenancy and rent arrangement, the limit of landownership, etc.[236]

Rent regulation, as stipulated in the law, shifts the emphasis from crop-sharing to fixed rents, thereby providing the tenants with greater incentives. The Crop-Sharing Law of 1960 regulates more elaborately the crop-sharing tenancy[237]; it requires that all tenancy contracts must be written and registered.[238]

According to the Basic Agrarian Law, the land in excess of the maximum holding will be expropriated and redistributed among small farmers and landless peasants.[239] An upper limit of 5 to 20 ha has been set up for the size of ownership, depending on the population density of the area, the fertility of the soil, the location of the farm, etc. For Java this limit is 5 ha for sawahs and 6 ha for dry land. But as most of the farmers in Java own less than 5 ha, this law is more important for some of the Outer Islands, where landlordism prevails, or where there is still land belonging to local communities, the so-called 'marga land'. The question whether the sizes mentioned above are sufficient, or too small for efficient farming, cannot be answered precisely

[235] Central Bureau of Statistics, *Agricultural census 1963*, p. 1.

[236] For the complete law see: Ministry of Agrarian Affairs, *Peraturan dasar pokok-pokok agraria*. Djakarta, 1962.

[237] The Crop-sharing Tenancy Law was enacted before the Basic Agrarian Law.

[238] At the end of 1963, there were already 25,345 contracts in 182 of the 259 regencies in the whole of Indonesia (see MPRS-Report, *Ringkasan Ichtisar Tahunan tentang Pelaksanaan Ketetapan MPRS No. II/MPRS/1960 jang berkenaan dengan Tahunan Pelaksanaan Pembangunan 1963*, mimeographed Report, Djakarta, 1964, p. 20).

[239] *Ibid.* The expropiated land was first estimated at 178,000 ha in Java, Madura, Bali, Lombok and Sumbawa, but after a more careful investigation, it amounted only about 74,000 ha of which about 40,700 ha was already redistributed at the end of 1963. See also O. SCHILLER, *Agrarstruktur und Agrarreform in den Ländern Süd- und Südostasiens*, Hamburg and Berlin, 1964, p. 125.

without careful investigations.[240]

In other densely settled areas in the world, like e.g. Japan the enlargement of farm size is not an absolute condition for increased agricultural production per hectare.[241] But the general feeling is that the average size of the Javanese farm as compared with the existing input factors, especially labour input, is too small.

With respect to the existing small farm situation, where individual holdings are fragmented, a strong case is also made in the Basic Law for re-allotment, the redistribution of land to reach larger units. But even if the redistribution of land is carried out in Java, every rural family cannot possibly be given a piece of land. Therefore, the landless are bound to take, and the larger landowners are bound to offer land under tenancy arrangement as stipulated by the government. This means that, in the short run, the only realistic policy is to recognize the inevitability of some form of tenancy and to legalize and promote the most efficient form of tenancy rather than to abandon it.

9.3 Education and research

9.3.1 Education

Education has always received special attention from the Indonesian Parliament, and the government gives it high priority as can be seen from Tables 118 and 119. Their sustained efforts caused an unprecedented increase of pupil and student enrollments.

The education in the field of agriculture kept abreast with this general development. This is indispensable to meet the needs of the expanding population and at the same time provide some improvement in the *per capita* food consumption. The necessary 4 to 5% annual increase in agricultural productivity can be reached only with improved technology, developed by education and research and applied by a large number of farmers.

Agricultural education is supplied in vocational agricultural schools, agricultural high schools and agricultural colleges and universities.[242] The latter are considered

[240] Actually not one measure is adequate to satisfy all purposes. A more useful approach is to determine what combination of resources would be required under anticipated natural and economic conditions to provide a reasonable income for the farmers. Unfortunately, data on the optimum farm size in the various districts in Java are scanty. Besides, according to Professor JOOSTEN, it is questionable whether there might be an optimum size of holding, since the prices of inputs and outputs are always changing. See G. R. SITTON, How to measure the size of farm business, in *Farm managements. Documents presented at the fifth FAO development center on farm management for Asia and the Far East. Manilla and Los Banos, the Philippines, 3–21 October 1960*, Manilla, 1961, pp. 28–29.

[241] In Japan and Taiwan, productivity per hectare has been raised manyfold without any significant enlargement of farm size.

[242] In 1966, the university level of agricultural education is still under the Ministry of Education. In addition this ministry has administrative authority over all other agricultural education, which also has shown a substantial development since World War II (see Tables 120–122).

by the government to be the most important, as they supply the highly trained people for leading functions in agriculture as well as the scientists for research and the staff for education on the two lower levels.[243]

In 1964 the number of university graduates in agriculture in Java amounted to 800. Some of them had their education outside Indonesia, but most of them came from the State University Faculties in Bogor and Jogjakarta.[244] The author has estimated that the minimum needed would be about 5000 persons[245], which certainly is attainable within a reasonable period.

As to the curriculum of the agricultural faculties, they should not be content merely with educating graduates who seek 'white collar jobs', but also with young people who are willing to get involved with the more practical aspects of agriculture, as encountered in agricultural enterprises and in the Extension Service.

Further it should be noticed that, especially in the field of agriculture economics, teaching depends too heavily on textbooks. Students will not gain a clear picture of their own agriculture by theory alone; this will tend to remain unrealistic and irrelevant to them, as textbooks are illustrated largely with data from foreign regions and sometimes are not modified to suit the specific situation at home.

Perhaps the government should also establish a specific department in one or more of the faculties to train the teaching staff of agricultural universities and high schools, bringing them in close contact with research findings, as at present the knowledge and skill of a great number of them is is not quite adequate.

Some words could be said regarding the agricultural college in Tjiawi (near Bogor). It has a four years' training after high school and it was established by the Ministry of Agriculture to satisfy the need of adequately trained people in a relatively short time. This college will be abandoned as soon as there are enough graduates from the universities to fill the vacancies of the ministry.

In 1958 there were 10 agricultural high schools in Indonesia, 3 of which were in Java.

In 1960 Indonesia had about 2000 farmer training courses (chiefly in Java) meeting for two hours a week for a period of 6 to 12 months. Also there were 8 months' to 2 years' duration vocational schools in agriculture for rural youth.[246]

Despite the relatively rapid development of these schools and courses, the author feels that the training program for prospective farmers has only been partly met.

[243] C. W. CHANG, *Present status of agricultural extension development in Asia and the Far East*, FAO, Rome, 1961, pp. 28–29.

[244] In 1964, the Agricultural Faculty in Bogor was included in the Institut Pertanian Bogor (the Institute of Agricultural Sciences), which is an autonomous university level educational institution directly under the Ministry of Higher Learning and Sciences. There are three other State Faculties.

[245] The author's estimation of the need of 5000 university agricultural graduates is confirmed by the Report of the National Planning Council (see MPRS, *Ichtisar Tahunan tentang Pelaksanaan Ketetapan MPRS No. II, 1960*, Djakarta, 1963, p. 10.

[246] CHANG, *op. cit.* (*fn.* 243).

Table 118. Number of schools and pupils in Indonesia, school year 1960/61.

	Number of schools	Number of pupils in 1000
Primary schools[1]	41,280	9,167
Lower and upper general secondary schools	4,241	542
Vocational schools:		
teacher training schools	282	35
technical and home economic schools	748	98
commercial schools	260	51
other schools	20	2.5
Total vocational schools	1,310	186
Faculties	59	29

[1] Including 1,826 pre-primary schools with 107, 000 pupils.

Source: *Statistical pocketbook of Indonesia 1963*, p. 29–31.

Table 119. Total number of schools and pupils (in thousands) in Indonesia for the years 1937–1938 to 1939–1940 and 1955–1956 to 1960–1961.

	1937–1938	1938–1939	1939–1940	1955–1956	1956–1957	1957–1958	1958–1959	1959–1960	1960–1961
Schools	21.0	21.4	22.3	31.2	33.5	32.3	41.7	44.1	46.9
Pupils	2,192	2,324	2,415	6,361	6,620	6,404	7,948	8,991	9,925

Source: *Statistical pocketbook of Indonesia 1963*, p. 29–31.

Table 120. Courses and colleges integrated in the College of Agricultural Science, Bogor (Tjiawi), 1958.

	Established	Number of graduates
College of Forestry	1949	80
Sea fishery course	1951	12
Sea fishery extension course	1952	29
College of agricultural extension	1952	54
College of biological sciences	1955	–

Source: State Planning Bureau, *Laporan pelaksaanan rentjana pembanguan lima tahun 1956–1960*, Table 106.

Table 121. State College of Sugar Industry Science (established in Jogjakarta, 1950).

Number of graduates up till	1955	44
Number of graduates in	1956	45
Total		89

Source: See Table 120.

Table 122. Main data on agricultural education, Indonesia, 1956–1958.

	Number of schools			Number of pupils		
	1956	1957	1958	1956	1957	1958
Agric. junior high school[1]	2	1	1	82	35	16
Agric. senior high school[2]	10	10	10	1,914	2,192	2,508
School for peasant agriculture	19	23	27	521	648	800
Course for peasants	4098	3314	1753	113,542	82,011	48,635
Course for peasants' organization	3558	4871	5000	368,114	386,799	400,000
Educational centre for village life	328	335	336	–	–	–
Forestry 'police' school	3	3	3	103	139	116

[1] Suspended in 1959.
[2] Cumulative number of graduates.

Source: State Planning Bureau, *Laporan pelaksaanan rentjana pembangunan lima tahun 1959–1960*, Table 107.

The reason is that many teachers of these schools, who are graduates from the agricultural high schools, are neither sufficiently trained in practical agriculture, nor well-equipped in general agricultural science subjects. Moreover, the salaries are low, and most of the alumni of the high schools prefer to work in private enterprises where they can earn more.

The development of a rational agricultural school system requires a certain ratio between the number of pupils in the three educational levels mentioned above. This means that, ultimately, the number of people with a vocational training has to be considerably larger than that with a high school education, and that the agricultural high schools have to supply considerably more trainees than the universities. At present Java has five universities in which agriculture is teached as against three agricultural high schools. Is this not an indication that the development in these two levels is not properly adjusted?

Can Indonesia afford to support so many agricultural universities? Could the same achievements not be got at less cost? For instance in just locating the agricultural universities in two places like Bogor and Jogjakarta, with their adequate facilities and teaching staffs? Is there any sense in building new universities which will not be run efficiently in terms of the expected cost? This seems to be a point worth-while cosideration by the government.

9.3.2 Research

The development of the agricultural research institutes at Bogor started in the past century.[247] Later on several stations were added, mainly private ones working in the

[247] The private research institutions dealing with research of non-farm agriculture will not be discussed in this section. They are already treated in Chapter 3.

field of commercial crops. After 1950, the Indonesian government continued to strenghten them.

In 1964, agricultural research was carried out by the Ministry of Agriculture (and Agrarian Affairs), the Ministry of Higher Learning and Science, the Ministry of National Research and the Ministry of Health.[248]

Most research institutes are organized by the Ministry of Agriculture, either on subject matter basis (e.g. plant pathology and entomology) or on a commodity base (e.g. rice).[249]

In view of the many institutes and the various ministries involved, the necessity of coordination became evident. Within the Ministry of Agriculture this has been realized in the Bureau of Research Coordination. The coordination of research activities between the Ministry of Agriculture and the Agricultural and Veterinary Science Faculties is carried out by the 'Dewan Kerdja Sama antara Lembaga-lembaga dan Fakultas-fakultas' (the Coordinating Council of Agricultural Research between Institutes and Faculties.[250] The Ministry of National Research, through its various research councils, has attempted to coordinate agricultural research where cooperation of more than two ministries is required.

As to the responsibilities of the other Ministries mentioned above, the dividing line is not always clear. For instance, it has been specified that the Ministry of National Research will be primarily concerned with those branches of agriculture where industrial application has already progressed (food canning, and wood preservation), whereas the institutes of the Ministry of Agriculture should carry out the more specific agricultural research. The consistency of this division seems questionable.

Further, it is gradually realized that agricultural research costs money and requires skilled manpower, two things which the government at present has in short supply.[251] The research organizations have to be rationalized. A central body, placed under the

[248] The Institute of Nutrition is under this Ministry.

[249] The agricultural research institutes in Indonesia are: the *Central Agricultural Research Institute* (Bogor) with 5 divisions (rice, soil, agricultural, botanical and plant pathology and entomology research institutes); the *People's Rubber Research Institute* (Bogor); the *Central Rubber Fund* (Bogor); the *Horticultural Research* (Bogor); the *Central Animal Husbandry Research Institute* (Bogor) with 7 divisions (animal industry research, chemical investigation in animal husbandry, animal nutrition research, livestock breeding, mixed farm research, animal husbandry research and poultry breeding, institutes); the *Central Veterinary Institute* (Bogor) with 7 divisions (acutely contagious diseases, serology and chronically contagious diseases, sera and vaccine, virus, bacteriological, pathology and parasitology and micrological institutes); the *Institute for Food and Mouth Disease Research* (Surabaja); the *Central Forestry Research Institute* (Bogor) with 4 divisions (forest research, forest product research, chemical technology of forests and forest working techniques institutes); *Aerial Survey Section* (Bogor); *Office for Land Utilization* (Bogor); the *Institute for Inland Fishery* (Bogor) and the *Research Institute for Food Technology* (Pasar Minggu). In addition, there are related research institutes such as those for estate crops. (C. W. CHANG, *Present status of agricultural research development in Asia and the Far East*, FAO 1964, pp. 27–48).

[250] The Head of the Bureau of Research Coordination is usually not the leader of the team of the officials of the Ministry of Agriculture in this Coordinating Council.

Ministry of Agriculture, should be created to coordinate the work of all agricultural research organization.

Priorities should be given to research in agricultural economics. Many Indonesian agricultural officials feel that, even with the existing technical knowledge available at the agricultural experiment stations, a substantial increase in agricultural production can be reached only on the base of economic data. This absence hampers the drafting of accurate and detailed agricultural development plans.[252]

A good start in this direction was the establishment of the Agro Economic Survey of Indonesia (AEI), a project which started in early 1965. The objectives of survey are to increase efficiency in the execution of the first National Overall Development Planning (1961–1969) in the field of agriculture and agrarian affairs, and to establish the foundations for the following stages of the National Development Planning (1969–1977).[253]

Perhaps the Faculties of Agriculture, which are now under the Ministry of Higher Learning and Sciences, should be put under the control of the Ministry of Agriculture, so that teaching, research and extension are united. Only along such lines it can be expected that the research institutes and the agencies in charge of agricultural development can tackle the massive problem of stagnation and low productivity in Java's agriculture.[254]

9.4 Organizing agricultural development

The development of physical, economic and educational factors as explained above are not sufficient to get agriculture moving: the package of knowledge has to be brought from the ministry and the research stations to the farmers. Or, as stated on the Conference on Productivity and Innovation in the Underdeveloped Countries: "Without this factor our package is incomplete and the other factors will remain barren. The factor of organization is perhaps the least tangible and least clearly understood of all the factors which go into the 'system problem' of agricultural development".[255]

[251] For instance, most of the agricultural research institutes do not work efficiently due to shortage of qualified people, who are discouraged to join these agencies because of the low salary and low prestige among the officials in the public service. There is also a shortage of laboratory equipment.

[252] MINISTRY OF AGRICULTURE, *Agro-economic survey in Indonesia project*, (mimeographed), Djakarta, 1965. The author will not suggest that non-agricultural economic research should be neglected, but due to lack of funds and skill, priorities should be given to agricultural economics.

[253] *Ibid.*

[253] WHARTON has given some research priorities in agricultural economics in South East Asia, some of which is applicable for Java. (Economic and non-economic factors in the agricultural development of South-East Asia, some research priorities, *ADC paper, August 1962, revised June 1963*).

[254] In 1966, the Faculties of Agriculture and Animal Husbandry, and the Institute of Agricultural Science were not yet included in the Ministry of Agriculture. But there are plans to accomplish this.

[255] Conference Report, p. 111. See also p. 119 of this study.

For instance in Java, despite the weakness in the research structure, far more in the field of technology is known than is used. The problems now are how to make these techniques viable to the farmers in a form they can use and how to create an environment which makes it possible to adopt innovations. This means that the aid of the extension services, the credit institutions, the cooperatives, the public administration and especially the village administration have to be called in. In addition transport facilities have to be developed. These subjects will be treated in the following sections.

9.4.1 Agricultural extension services

Agricultural extension in Indonesia started as early as 1911. Its central agency is the Agricultural Extension Service of the Ministry of Agriculture, located at Pasar Minggu near Djakarta. At present it is organized at national, regional and local levels.

The agency carrying out the extension work is the provincial government. In 1960, the total extension force in the country was about 6000 people, most of them with only six years of primary school training.[256] One of the important tasks of the Extension Service is the close observation of the food situation and the production of food crops, so that measures can be taken in time if the situation threatens to become critical. Another task is to supply the farmers with implements, seeds of high yielding rice strains, planting material, fertilizers, and chemicals for combatting pests and diseases. It also operates a large number of farms where seed, supplied by the Central Agricultural Research Station at Bogor, is multiplied and distributed among the farmers. Furthermore, the extension service gives information on irrigation and irrigation schemes and stimulates the growing of rice and export crops. It also sets up training centers and supplies agricultural education through village education centers and farmers' training courses.[257]

In 1960, about 250 village educational centers were established, each under the charge of an extension worker. They have at their disposal 0.8 to 2 ha of land for demonstration purposes and a building for meetings and exhibitions, and for storing seeds, tools and insecticides. Even a small library is present. Besides these centers are meeting grounds for the village community and they are used for social and educational purposes.[258] In 1959 part of the work was transferred to so-called paddy centres, specialized in rice growing.

It is amazing to note that before World War II Indonesia was one of the few coun-

[256] See footnote 243.

[257] In 1960, there were three in-service training centers in Java: one in Lawang, East Java, for training in horticular crops, another in Pasar Minggu, near Djakarta, for farm mechanization and seed improvement, and one in Bandung in charge with village educational centers. Candidates with successful records after a minimum of five years of extension service, are selected and sent to training centers for one year of practical education on government expenses. See CHANG, *op. cit.* (*fn.* 243).

[258] CHANG, *op. cit.* (*fn.* 243).

tries where an effective extension service was established. It can be said that it was quite well organized. After the war, however, it had to face many problems, such as:

(1) Shortage of trained personnel, notwithstanding the establishment of in-service training centres. There are now about 6,000 workers for the whole of Indonesia (about 4,000–5,000 in Java) to serve ten million farmers, or 20,000–25,000 farmers for every extension worker!
(2) Inadequate payment and travel allowances for the workers.
(3) Lack of adequate funds: the budget for the extension service is usually below 5% of that of the Ministry of Agriculture.
(4) Lack of clear understanding of extension concepts on the part of many agricultural administrators and policy makers. In many cases extension services are used as agencies to undertake whatever the Ministry of Agriculture wants to have enforced at village level, so that the extension workers cannot confine themselves to the task of teaching and advising.
(5) Finally there is the problem of organization. If the various agencies engaged in extension work could be combined under one administration with agricultural research and other training this would lead to a more efficient use of staff members, and a number of them could serve as specialists or as farm advisers.[259]

Experience in other countries has shown that the expansion of extension work would not involve high costs as compared with other agricultural development projects. So in Kenya the improvement of the extension service has resulted in an considerable increase of agricultural production as shown in Table 123.

Table 123. Capital acquisition of smallholders production in Kenya (percentages).

	Return to invested capital	Return to the government
Smallholders' tea growing	60	21
Agricultural Extension	36	2
Irrigation	25	10
Low density resettlement	2–6	5

Source: H. RUTHENBERG, *Smallholder production development policy in Kenya*, Berlin, 1966.

9.4.2 Credit institutions

The agencies which help farmers meet their credit needs can be classified as non-institutional and institutional. As earlier explained, the non-institutional credit agencies are primarily private moneylenders and the institutional ones chiefly government owned.

[259] See 9.3.

The principal agricultural credit institutions in Java and Madura are the Bank Koperasi Tani dan Nelajan (BKTN, Farmers' and Fishermen's Cooperative Banks), the Bank Desa (Village Bank), the Lumbung Desa (Village Paddy Banks), and the Pegadean Negeri (Government's pawnshops).

There are other agricultural credit agencies established primarily for specific crops; among them are the Jajasan Tebu Rakjat (JATRA, Peasants' Sugarcane Foundation), the Jajasan Perkebunan Rakjat Indonesia (PERRIN, the Smallholders' Export Crop Foundation), primarily for tobacco, and the Jajasan Karet Rakjat (Smallholders' Rubber Foundation).

The Farmers' and Fishermen's Cooperative Bank (BKTN) is a merger of the Bank Tani dan Nelajan (BTN, the Farmers' and Fishermen's Bank) and the Bank Rakjat Indonesia (BRI). It was founded in 1960.[260]

The BKTN lends somewhat larger amounts to landowners than the Village and Village Paddy Banks for periods up to twelve months.[261] Its offices are usually located in the capitals of the regencies. The total loans supplied by it are given in Table 124, a substantial part was extended to the rural sphere, primarily for agricultural needs, as illustrated in Table 125.

It is very difficult to judge how much real profit the BKTN has gained from its operations, since it is not easy to select an appropriate deflator for the ever declining purchasing power of the rupiah. In money terms the BKTN did make a good profit, as it borrows money from the Central Bank (the Bank Indonesia) against the relatively low rate of 4% per annum and lends it out against 12% (a very moderate rate in times of heavy inflation) to the farmers.[262] Since for the application of a loan from the BKTN collateral is required, the risk in extending loans is not great. Although the interest rate of 12% is relatively low as compared with that of the private moneylender (some people say they charged 60 to 72% in 1958), there is still some criticism by the Indonesian politicians on the BKTN operations for charging too much interest.

The considerable increase in both the number of depositors and the amount of the deposits of the BKTN after 1958 (which is shown in Table 126) is no proof of increased savings.

[260] The Algemene Volkscrediet Bank (AVB, General People's Credit Bank), established in 1934, was an offspring of the economic crisis in the thirties. It was an amalgation of old-established institutions for people's credit (BOEKE, *op. cit.* (*fn.* 185), p. 160). By Emergency Law, afterwards established as a law by Act no. 77 (*Government Gazette 1958*, No. 36), the BTN (Farmers' and Fishermen's Cooperative Bank) was set up with a capital of Rp 100 million, provided by the government. Shares are to be spread regionally, and finally to be transferred to cooperatives and comparable institutions. Priority shares remain in hands of the Autonomous Regional Government (*Bank of Indonesia Report 1958/1959*, p. 120).

[261] It is difficult to state the maximum amount which can be borrowed by one landowner because it changed several times due to inflation.

[262] Usually the BKTN invests part of its profit in real estate like land and buildings. In the meantime the interest rate has been increased several times. In 1960 it was 15%.

Table 124. Loans supplied by the Bank Koperasi Tani dan Nelajan (Farmers' and Fishermen Cooperative Bank), in Java and Madura, 1938–1940 and 1953–1962 (in million rupiahs).

	Advances	Repayments	Outstanding loans[1]	Arrears	Number of agencies
1938	21.6	18.8	20.8	1.7	68
1939	24.2	22.0	22.7	1.4	68
1940	22.5	23.4	21.6	1.2	68
1953	689.8	519.8	376.3	42.3	69
1954	656.7	638.6	391.1	62.2	69
1955	836.2	735.8	488.3	69.3	69
1956	1,265.8	1,135.8	622.6	96.1	69
1957	1,266.9	1,306.5	598.8	94.6	70
1958	1,831.–	1,716.2	714.6	93.2	70
1959	2,338.8	2,136.9	907.7	91.6	70
1960	4,813.2	3.952.4	894.3	867.1	70
1961	2,940.3	2,531.0	1,241.1	118.6	70
1962	10,199.3	8,150.7	6,588.9	1,391.2	70

[1] At end of year.

Source: *Statistical pocketbook of Indonesia 1963*, p. 232.

Table 125. Loans in the rural sphere supplied by the Bank Koperasi Tani dan Nelajan (Farmers' and Fishermen Cooperative Bank), in million rupiahs (1938–1940, 1953–1962), for Java and Madura.

	Advances	Repayments	Outstanding loans[1]	Arrears
1938	9.6	8.1	8.5	1.2
1939	12.5	10.7	10.1	1.0
1940	12.0	12.2	9.7	0.9
1953	149.3	139.0	85.1	12.0
1954	146.0	150.3	80.8	13.0
1955	150.3	139.1	93.0	13.9
1956	133.0	143.3	82.9	17.0
1957	116.7	128.0	72.0	12.4
1958	229.8	284.5	162.7	19.2
1959	411.2	397.4	215.7	19.1
1960	483.5	440.3	258.7	17.6
1961	650.4	520.3	387.4	29.5
1962	4,690.1	2,392.2	4,663.7	1,174.1

[1] At end of year.

Source: *Statistical pocketbook of Indonesia 1963*, p. 235.

Table 126. Number of depositors and amount of deposits in the Bank Rakjat Indonesia (People's Bank of Indonesia), 1956–1957.

	1956	1957
Deposits at the end of the year	Rp. 735,326,000	Rp. 1,252,736,000
Number of depositors	167,943	206,467

Source: JACOBY, p. 77 (see footnote 66).

Table 127. Money loans in million rupiahs supplied by Village Banks and Village Paddy Banks in Java and Madura, 1938–1940 and 1953–1962.

	Number of banks	Outstanding at beginning of year	Advances	Repayments	Outstanding at end of year	Arrears at end of year	Number of loans granted (in thousands)
Village Banks:							
1938	5,619	3.1	19.2	18.9	3.4	0.0	1,017.6
1939	6,753	3.4	21.1	21.0	3.5	0.0	1,057.4
1940	6,925	3,5	21.7	21.6	3.6	0.0	1,069.4
1953	4,373	14.7	153.2	120.9	49.2	0.7	1,801.8
1954	4,604	49.2	200.2	191.9	57.4	3.8	1,942.2
1955	4,660	57.4	223.9	216.2	65.1	5.7	1,859.1
1956	4,633	65.1	232.9	230.4	67.6	8.4	1,778.0
1957	4,589	67.6	232.6	231.9	68.2	8.3	1,658.6
1958	4,587	69.0	241.7	239.6	70.1	7.1	1,591.4
1959	4,515	70.1	269.7	265.1	74.4	5.7	1,512.1
1960	4,456	74.4	328.9	312.4	90.9	4.9	1,553.7
1961	4,464	90.9	458.7	427.9	121.7	5.1	1,556.3
1962	4,321	121.7	631.3	597.8	158.2	3.7	12,580.1[1]
Village Paddy Banks:							
1938	5,561	0.0	0.0	0.0	0.0	–	–
1939	5,512	0.0	0.0	0.0	0.0	–	–
1940	5,451	0.0	0.0	0.0	0.0	–	–
1954	3,635	3,0	3.5	4.2	2.4	–	–
1955	3,635	2.4	2.3	3.0	1.7	–	–
1956	3,604	1.7	2.8	2.8	1.7	–	–
1957	3,603	1.7	3.0	3.1	1.6	–	–
1958	3,602	1.6	3.0	2.8	1.7	–	–
1959	3,582	1.7	2.2	2.5	1.3	–	–
1960	3,325	1.3	1.8	2.2	0.9	–	–
1961	3,160	0.9	2.9	2.5	1.3	–	–
1962	2,993	1.3	2.3	2.7	0.9	–	–

[1] Including the number of farmers participating in the SSB campaign.

Source: *Statistical pocketbook of Indonesia 1963*, pp. 237–238.

Table 128. Paddy loans in million kg supplied by Village Paddy Banks in Java and Madura, 1938–1940 and 1954–1962.

	Loans outstanding at beginning of year	Advances	Repayments	Remitted	Loans outstanding at end of year
1938	4.7	108.8	108.5	0.0	5.0
1939	5.0	110.7	109.4	0.0	6.2
1940	6.2	110.0	112.1	0.1	4.0
1954	71.8	63.6	58.2	0.9	76.4
1955	76.4	60.7	55.4	1.7	80.0
1956	80.0	48.2	50.7	0.1	77.5
1957	77.5	47.8	47.0	0.1	78.2
1958	78.2	45.1	45.9	0.8	76.4
1959	76.4	41.6	45.0	2.4	70.5
1960	70.6	45.6	44.5	3.9	67.6
1961	67.6	43.4	39.8	1.6	69.5
1962	69.5	38.7	40.0	0.8	67.4

Source: *Statistical pocketbook of Indonesia 1963*, p. 238.

Table 129. Agricultural bank credits, 1957.

	Number of debtors	Total value (Rp)
People's Bank of Indonesia	353,181	328,014,370
Village Banks	1,658,473	232,563,000
Village Paddy Banks	582,200	47,805,000[1]
Total	2,593,854	608,382,370
Bank for Farmers and Fishermen		33,058,140
Total		641,440,510

[1] The loan is in the form of paddy totalling 47,805 tons at Rp. 1000 per ton.

Source: JACOBY p. 78 (see footnote 66).

Table 130. Pawnshops in Indonesia, 1938–1940 and 1953–1962.

Year	Number of pawnshops	Loans in million Rp			Number of pledges in millions
		issued	redeemed	outstanding	
1938	460	85	78	33	43.5
1939	462	87	83	33	46.0
1940	468	88	85	33	49.6
1953	397	1,087	952	384	36.2
1954	410	1,217	1,225	377	37.6
1955	414	1,606	1,388	595	42.0
1956	422	1,967	1,890	752	46.4
1957	430	2,042	2,082	711	46.3
1958	435	2,398	2,320	789	45.4
1959	440	3,928	3,239	1,482	39.9
1960	443	8,953	6,043	4,393	45.2
1961	443	12,156	10,971	5,578	48.6
1962	443	24,670	20,234	10,015	47.0

Source: *Statistical pocketbook of Indonesia 1963*, p. 239.

Table 131. Credit requested by Perrin (for peasants' tobacco) in 1000 rupiahs, 1955–1959.

Crop year	1955/1956	1956/1957	1957/1958	1958/1959
Credits	49,250	52,350	58,050	63.750

Source: State Planning Bureau, *Laporan pelaksanaan rentjana pembangunan lima tahun 1956–1960*, Djakarta, 1960, p. 177.

Table 132. Credit extended by Jatra (for peasant's sugarcane), 1955–1959.

Crop year	Extended credit (in 1000 Rp.)	Planted area of 'Jatra' cane (in ha)	Production of 'Jatra' cane (in tons of sugar)	Total area of peasant's cane (in ha)
1955/56	38,534	16,120	103,492	26,225
1956/57	33,339	9,381	90,062	21,680
1957/58	28,215	7,991	55,937	20,000
1958/59	18,600	5,000	n.a	n.a.

Source: See Table 131.

Table 133. Data on the various types of cooperatives in Indonesia (1940, 1958–1962).

		Nr. of societies	Nr. of members in 1000	Deposits	Reserves	Creditors	Debitors
				(in million rupiahs)			
Central cooperatives	1940	15	0.4	0.2	0.0	0.0	0.1
	1958	216	9.5	343.5	104.5	471.1	393.1
	1959	246	11.7	406.9	33.6	503.3	–
	1960	350	19.7	159.0	27.1	–	–
	1961	289	21.7	283.0	38.6	–	–
	1962	1,279	32.4	550.8	79.1	–	–
Village cooperatives	1940	53	2.1	0.0	0.0	0.0	0.0
	1958	4,750	1,108.9	80.4	10.7	24.1	78.7
	1959	5,390	1,329.4	102.1	13.2	23.1	–
	1960	–	2,767.1	210.2	18.9	0.0	–
	1961	14,843	3,489.3	476.6	21.3	0.0	–
	1962[1]	18,818	4,854.5	587.9	54.2	0.0	–
Credit cooperatives	1940	478	41.3	0.3	0.0	0.0	1.2
	1958	5,526	689.2	171.8	14.0	36.5	155.9
	1959	6,095	756.6	223.0	19.0	46.5	–
	1960	6,347	871.5	317.1	27.2	0.0	–
	1961	8,573	1,023.3	439.1	28.5	–	–
	1962	10,986	1,276.2	765.0	57.5	–	–
Paddy storage cooperatives	1940	19	1.3	0.0	0.0	0.0	0.0
	1958	531	56.3	2.5	0.5	1.4	2.4
	1959	1,450	153.5	28.9	7.1	19.8	–
	1960	1,993	199.7	69.9	12.5	–	–
	1961	2,712	254.7	196.7	23.6	–	–
	1962	3,927	374.1	246.9	62.0	–	–
Production cooperatives[2]	1940	43	2.0	0.0	0.0	0.0	0.0
	1958	2,048	168.3	280.2	44.0	165.1	98.6
	1959	1,216	139.1	388.6	55.2	120.8	–
	1960	1,144	122.3	570.2	63.7	–	–
	1961	1,702	177.1	799.6	76.2	–	–
	1962	2.747	263.6	1,395.3	153.0	–	–
Consumer cooperatives	1940	23	0.6	0.0	0.0	0.0	0.0
	1958	805	113.1	19.4	2.1	8.0	11.8
	1959	1,935	244.1	47.4	3.3	8.5	–
	1960	6,461	1,259.4	118.3	4.2	–	–
	1961	9,736	1,859.4	323.3	30.0	–	–
	1962	13,419	2,961.1	690.3	44.3	–	–
Other cooperatives	1940	8	0.1	0.0	0.0	0.0	0.0
	1958	270	53.2	10.6	1.3	4.4	7.1
	1959	272	43.5	9.7	0.7	4.6	–
	1960	329	36.6	17.6	1.1	–	–
	1961	947	83.0	113.8	2.8	–	–
	1962	1,540	161.6	138.8	4.1	–	–

Table 133. (vervolg).

		Nr. of societies	Nr. of members in 1000	Deposits	Reserves	Creditors	Debitors
				(in million rupiahs)			
Total	1940	639	47.8	0.4	0.0	0.1	1.3
	1958	14,146	2,198.5	908.4	177.1	710.6	747.6
	1959	16,604	2,678.0	206.5	132.0	726.6	–
	1960	27,652	5,276.3	1,462.3	154.9	–	–
	1961	38,802	6,908.5	2,632.1	221.1	–	–
	1962	52,716	9,923.5	4,374.3	404.2[2]	–	–

[1] Multipurpose cooperatives.
[2] Also covering cattle breeding, fishery and industry. Amounts in Straits $ in the Riau Islands have been converted.

Source: *Statistical pocketbook of Indonesia 1963*, p. 241.

JACOBY[263] explains that the forced closing of many foreign banks, mostly Dutch, in December 1957 and thereafter, caused depositors to transfer their savings to the BKTN and likewise induced commercial companies to transfer a considerable part of their funds to this bank. But the primary objective of the banks is to assist the farmers, and this is not fully accomplished. On the other hand, the Village Banks and the Village Paddy Banks, which are administered by the BKTN are more appropriate to the needs of the farmers. The government provided an initial capital of Rp 150 million.[264] Unfortunately their number is not adequate to furnish the farmers' need.

The *Village Banks* are small money banks set up by the local authorities to furnish small loans to the farmers, redeemable in weekly installments.[265] Their number has decreased since 1955, as can be seen from Table 127. Before the war, these Village Banks played an important role; after the war, some of them were abolished and some were taken over by the BKTN.

The *Village Paddy Banks*, rice barns, also supervised by local authorities, have been established to grant credit in paddy. The number of them in operation has also decreased since 1954 as is illustrated by Table 128.

These banks are important in assisting the farmers to overcome the difficult 'patjeklik', the period between planting and harvest. They are very old institutions in the Javanese society. The value of the paddy is fixed at a certain price; the debt can be repaid either with paddy or in money, with interest. Certainly, these village banks are great help for the farmers and it is to be regretted that their number has declined.[266]

[263] JACOBY, *op. cit.* (*fn.* 66), p. 77.
[264] In what year is not mentioned.
[265] JACOBY, *op. cit.* (*fn.* 66), p. 77.
[266] *Ibid.*

In 1958, the BRI charged an interest of 12% per annum, the Village Banks 1% per week. Rice loans were supplied at 40% per six months. These were the official rates and they certainly were very high, but due to the shortage of capital and inflation, they could not be reduced.[267] But as compared with private moneylenders and shopkeepers who asked for 5 to 6% per month for money loans and 100% per 6 months for rice loans, the official rates were moderate.[268] On the other hand, as said before, moneylenders' credit is easier and much more convenient to get.

To give an idea about the credit granted by the principal credit institutions, some data for the year 1957 have been mentioned in Table 129.

In addition to the three kinds of banks discussed above, the pawnshops are an important source of agricultural credit, although not all loans are extended for this purpose. They are organized as a government monopoly. Table 130 gives an idea of their importance.

There are other government credit institutions supporting special agricultural activities, as, for example, for the cultivation of sugarcane, tabacco, copra and kapok. The results, up to 1958, can be seen in Tables 131 and 132. The agricultural credit cooperatives will be treated in the section regarding cooperatives.

9.4.3 Cooperatives

After World War II the cooperative system was rehabilitated and energetically extended, as illustrated by the data in Table 133. Credit and consumption cooperatives dominate.

This rapid growth is primarily due to the full assistance and guidance of the government which is well aware of their importance and has accepted cooperatives as the ultimate goal for the distributive system in the economic process. But its success cannot be judged by numbers only. Shortcomings in organization, unfamiliarity with cooperative working methods, lack of business knowledge on the part of the directors, insufficient control, etc., caused that not all attempts met the government's expectations. Up to now there are only 6174 production cooperatives, including the lumbung (paddy storage) cooperatives, or only 12% of the total number of cooperatives (see Table 133).[269]

The Ministry of Cooperatives, in collaboration with the Ministry of Agriculture, has made many efforts to get the idea of cooperatives accepted by the farmers. To accomplish this, it is necessary to make the farmers understand better the underlying ideas. But their mental adjustment, necessary to distinguish between expenses for consumptive and those for farm business, is far from easy.

Perhaps, if the credit cooperatives want to succeed in assisting low-income farmers, they must be organized in the same way as the producers' cooperatives. The author

[267] *Ibid.* The rates charged by the BKTN were increased to 15% in 1960 as earlier explained.
[268] *Ibid.*
[269] *Statistical Pocketbook of Indonesia 1963*, pp. 240–241. The figures given for the cooperatives are actually for the whole of Indonesia. The Java figure is estimated to be about 80% of the Indonesian.

would like to add that one of the means to reach this goal is to adopt the supervised credit approach.[270] However, before this approach can be carried out on a large scale, first the educational level of the farmer should be raised and the operations of the Agricultural Extension Service should be improved and extended. But, as explained under 9.4.1, this Service has a severe shortage of trained personnel.

9.4.4 Public administration program

In the present situation in Java public leadership and coordination of effort must play a large part in agricultural development. Therefore, the government has attempted to design local organizations to bring the various elements of the public administration program into direct contact with the farmers. These elements include credit dissemination or information, marketing, input supply, additional irrigation and local government. The operating units have to complement one another at the village level and preferably also throughout the administrative organization. But up till now the results have not been up to expectations.

A sufficient knowledge of the principal types of social structure in the villages is a prerequisite for designing an effective development program, and to identify the best point in the village community on which to build such a program. Should it be the cooperatives, the community development organizations, or some new form of organizations?[271]

At the national level, the interdependence of the different elements in a program to increase agricultural output is so great that an organization must be designed to ensure that each element is to be carried out on net output. At present, most of these elements are ineffective (credit institutions, cooperatives, extension, etc.). The agricultural bureaucracy does not have the capacity to execute such a complex program at the farm level.

Input interactions or measures of the spectrum of factors must be accounted for in designing farm planning and land reform, etc. These factors require efficient organization, careful selection of personnel, in-service training and, above all, the capacity to lead, to communicate and to improvise.

Finally it is necessary to find ways to make it more attractive for government workers to serve agricultural development. This relates to the general administration as much as it does to the technical departments which are more directly concerned with agriculture. For, becoming a professional agricultural research or extension worker,

[270] This supervised credit was developed by the Farm Security Administration (FSA) before World War II in the United States. It consists primarily in farm and home planning, the provision of credit to meet the essential family and farm expenses by the timely release of loan funds on the basis of operational needs and the extension of technical assistance to the farmers and the housewives. This supervised credit approach has been adopted in the rehabilitation of low-income farm groups all over the United States with encouraging results, particularly in the southern states.

[271] Community development will be discussed later in this study.

it is rather unsatisfactory to stand near the bottom in prestige among officials in the public service. It is possible that, to accomplish these ends, the government's administrative structure should be changed. But at present, efforts should be directed primarily at drafting a program to promote agricultural development in the present administrative organization.

9.4.5 Community development

The government of Indonesia is aware of the importance of community development as a policy for economic progress in general and agricultural progress in particular.

Community development has many definitions, but the author tends to agree with OTHMAN who has given the following: "Community development means the creation in villages of favourable attitudes towards general improvement, the coordination of the various services from the government reaching the villages and uniting all the efforts of the people to help themselves in development."[272]

HIGGINS[273] remarked that there is a close relation between community development as an approach to economic development and the "up by the bootstraps" approach. He explains that the governments of several underdeveloped countries, discouraged by the magnitudes of the capital requirements suggested by calculations, have seized upon community development as an easier path.

One of the considerations for community development projects is that the rural districts of Java contain immense reserves of potential human energy and initiatives. These resources are largely dormant and will not develop at their own accord. Therefore, they must be actively stimulated by arousing hope of a better future and the desire to work and cooperate energetically for local and ultimately national improvement.

A second consideration is that rural problems in Java are so multiple and complex in nature, that providing the many services required by each village is beyond the means of the government. Community development aims at overcoming these difficulties by helping the rural people to utilize effectively the available outside help. In Java community development movements have been able to build on traditional forms of communal cooperation such as the custom of 'tolong menolong' and 'gotong rojong'.[274]

The establishment of a Ministry of Community Development in 1963 initially raised high hopes. Although considerable difficulties are involved in attempting to measure the achievements of community development programs, it seems generally true that they have contributed something to the future growth of productivity

[272] A. D. OTHMAN, Community Development, *Agricultural planning studies no. 3, Lecture on agricultural planning*, FAO-publication, Rome 1963, p. 219.

[273] B. HIGGINS, *Economic development. Problems, principles and policies*, London, 1959, p. 679.

[274] 'Tolong menolong' means to help each other in time of needs and 'gotong rojong' means to accomplish something by mutual efforts, whereby each member of the community contributes his share according to his capability.

through their emphasis on human development, especially through improved health and education. But there is also some feeling that community development has not lived up to these high hopes. This may be partly due to the fact that too much was expected too soon from programs that are of quite recent origin.[275]

9.4.6 Transport and communication facilities

Although it can be said that Java has good transportation and communication facilities as compared with the Outer Islands, yet they are far from adequate. Overaged railroad equipment must be rehabilitated. High priority should be given to the operation of the harbours to speed up export and facilitate deliveries. The system of combined railroad and ferries between Java and some of the Outer Islands must be expanded. The maintenance of the existing roads and the construction of new ones are urgent.

Inefficiency of transport facilities are factors hampering the marketing services. Its delays and serious damages and losses of products, add to their cost (as, for example, the fluctuation of the food prices in Djakarta indicates). This will also create social unrest.

Statistics for 1962 show that the railroads in Java suffered from shortage of spare-parts and maintenance of existing material. Casual observation also suggests that road transport equipment is used in an inefficient way. The organization of trucking and public transportation is usually poor. Besides, there appears to be an excessive import of passenger cars as compared with that of trucks and buses. Also maldistribution of trucks between different regions on Java adds to the inadequancy of transport facilities.

Thus improvement of transport systems is one of the most important requirements to agricultural development in general and agricultural marketing in particular. As shown above, a substantial part of the differences in prices is due to the chronic defect in transport facilities.

9.5 Concluding remarks

In conclusion it can be stated that the government has seriously attempted to increase productivity in peasant agriculture. But it is obvious that the cooperation of the farmers is essential. The best way to accomplish this is to give the peasants the remuneration they are entitled to for their share in the production process. But the government's policy could be motivated by other considerations, without properly assessing the economic loss involved. The Three Years Rice Program 1959–1962, could illustrate this point.

[275] The program started in 1955.

9.5.1 The setup of the Three Years' Program

Rice is by far the most important crop and it is also the economic foundation of peasant's agriculture in Java.

In 1959, the government launched a three year program to be self-sufficient in rice, as seen in Chapter 4. In cooperation with the Ministry of Public Works, existing irrigation works were repaired and new ones built to irrigate more land. Silos were constructed and paddy-centres established. Also the use of chemical fertilizers, better farm implements and technical assistance by services and agencies of the Department of Agriculture were improved. A special organization like the Badan Pimpinan Umum (BPU) Pertani (the Board of Directors of the Agricultural State Enterprises) is entrusted with the major share in carrying out of the program. The Ministry of Agriculture established 500 paddy centres for the distribution of high yield rice seed, fertilizers, insecticides, farm tools and information about making the best use of the commodities. Cash loans were available for the farmers for buying implements to increase production.

At that year the paddy centres controlled 3,000,000 ha sawah and, including the second crop rice in the dry season, 4,010,500 ha[276]. In areas not served by paddy centres, or where the BPU Pertani did not have organized units, the Agricultural Extension Service was responsible for carrying out the program.

9.5.2 Evaluation of the Three Years' Program

For a number of reasons (organization, administration) the program to raise domestic rice production was only partly successful. An increase of 25% was expected in too short a period (3 years), whereas past experiences showed that this increase could only be achieved in 9 years. Then the government thought that results would come quicker by creating an organization on a military base, the KOGM (Welfare Operation Command). The farmers were instructed to use fertilizers, improved seeds, etc. But this rigid measure only tended to foster a passive resistance from the side of the farmers.

Obviously the rapid pace for these innovations put too great a strain on the farmers. The time available to master new skills (for example, the application of fertilizers), to learn the proper use of credit and sometimes even to accept unsettling changes in their traditional environment (for example in the operations of the KOGM) was too short.

But all these shortcomings cannot be attributed to the farmers alone. The government too had its shortcomings. For instance, as mentioned before, the distribution and storage facilities for the necessary inputs were not adequate, and the government did not provide enough to supply sufficient improved seed. These circumstances also

[276] See 4.3 and 6.2.3.

prevented moving the program on a larger scale.

The primary and the secondary canals for irrigation are attended to by the government, but the farmers are responsible for the tertiary canals. Yet the government should also have a look after the latter, for fertilizers will be partly wasted if this kind of canals does not operate well.

A program to combat pests and plant diseases is necessary to match the other technological improvements, but it is reported that the results of the researches at Bogor do not reach on a sufficient scale the worker in the field, primarily due to lack of funds and personnel.

Credit must be extended to the farmer in proportion to his needs and not to his status. Uneconomic loans are selfdefeating, poor repayment and heavy overdues have occurred. In the SSB campaign, repayment was expected to be in kind.

Since this proved to be difficult, cash was required instead, but heavy inflationary pressure did not solve the problem.

The government cannot always get the needed persons in accordance with its program. For example, in the case of the paddy-centers', the program did not work well because, among others, of lack of suitable persons for that kind of work. Government officials involved with the program must actually be an agent of change: in the form of extension officer, cooperative organizer or local official he must bring innovation to the farmers and win their confidence. The encounter between farmers and bureaucrat is a crucial point in the process of agricultural development.

Thus we have seen that the farmer and the government are the key factors in catalyzing agricultural development.

Governmental price policy is very important to increase agricultural production. For example, the government distributes rice at prices well below market prices. Thus it makes consumption and hence production targets higher than would be dictated by normal criteria. On the other hand, as it pays a low rice price to the farmers, it discourages them to increase their production. With the result that rice still has to be imported from abroad, subsidy costs increase and inflation accelerates. Then the government decided to direct its subsidies to purchased inputs, like ferilizers, improved seeds, pesticides, etc., rather than raising the rice prices. It has also considered that the cost of the subsidy program is directly related to the utilization of practices, which will increase the productivity. Another thing is that, by inducing this kind of policy, the government thought it could avoid the political consequences of raising food prices.

In contrast with the above, the government thought that higher rice prices added to the income of both non-innovators and innovators.[277] It considered also that this windfall income, generated by the higher prices, may to some extent decrease the incentives of some farmers to raise their production, as they could permit themselves to have more leisure. However, as shown earlier, a low rice price does not give enough stimulus to the farmers to raise their productivity.

[277] Innovators are farmers who like to use fertilizers and other improved agricultural inputs.

Judging these arguments, the author is of the opinion that a higher rice price will give more incentive to the farmers in increasing the production. But at the same time it is desirable that price fixing, or the provision of subsidies, should be applied to important inputs, about the value of which the farmer may be sceptical, like fertilizer and improved seeds.

Of course, this subsidy program will cost the government much money, but perhaps it can be partly recovered by higher tax revenues resulting from a reorganization of the present landtax system.[278]

While the government intervenes directly in the fixation of prices, it may also take steps to improve prices in other ways, e.g. with more ample credit facilities to remove the need for hasty sales, in strengthening the bargaining power of the farmer by the establishment of cooperatives.

More of this increasing productivity of peasant agriculture, especially in the rice program, will be discussed in Chapters 10 and 11.[279]

[278] Within the rural sector, some areas of taxable capacity are now practically free from taxations. The present tax system does not fully tap the resources available in the rural sector. For instance, the land tax is levied at low nominal rates and valuations existing in the period when there was no heavy inflation but is not adjusted to the new situation.

[279] The government has launched a new program to increase food production known as the 'Bimas' (Bimbingan Massal, Guidance on Mass Scale) extension program. It originated from the Bogor Institute of Agriculture in the 1962/1963 rice season in Java and was expanded on a national scale in 1964/1965. Most of the Bima's extension workers are students. The program tries to achieve self-sufficiency in food production in a longer time span than the SSB campaign. The first results seem to prove that Indonesian farmers will respond well to agricultural extension if there are adequate supplies of fertilizer, insecticides and agricultural implements. (See D. H. PENNY and DAHLAN, THALIB, Survey of Recent Developments, *Bull. Indon. Econ. Stud. 6*, February 1967, p. 26.

10 Appraisal of the results of past plans and policies

10.1 Why has agricultural development not been successful?

The first thing to do in the appraisal of the results of past plans, policies and actions, is to review the criteria to be applied in the evaluation of the government's attempted measures to alleviate the deteriorating economic situation in Java. These criteria depend on the objectives of the successive agricultural plans (see Chapter 6).

Special problems confronting the Indonesian government, as already explained earlier, are: (1) insufficient food production (Chapter 9), (2) the need to expand export (Chapter 8) and (3) the population pressure on land in Java (Chapter 7). Thus a program has been set up to find a solution to those problems. But it appeared that the government failed in fulfilling its objectives, and the question remains why the agricultural development in Java has not been accelerated.

The causes of the failure of the agrarian policy as regards overall agricultural development may now be listed as follows: (1) the lack of political stability and continuity, (2) the multitude and inconsistency of the government's objectives in pursuing agricultural development, and (3) the absence of any clear-cut doctrinal concept of the government's agrarian policy as to the political attitude towards the peasants.

A successful development program requires at least some degree of political stability and continuity. In Indonesia the rapid changing of cabinets in the fifties, the various uprisings, the dispute about West-Irian, the confrontation with Malaysia and the attempted coup in 1965, reflect the political instability of the country. They all involved high costs, particularly in the economic sphere, as too many resources had to be committed for non-economic purposes. In addition, the inefficiency of management and corruption have brought the country into a very difficult situation. This economic deterioration again results in further political instability.

Although it is understandable that the government's efforts have been devoted mainly to building a sense of nationhood and unity in search of a workable structure and governmental administration, the political ends should not interfere with good management of the economy. Economic development and political stability are, in fact, two sides of the same coin. No government can let economic development wait too long while it manoeuvres to keep in power, especially where the realization of agricultural development programs require the active participation of a very large number of peasants, and the modernization of a traditional agriculture requires time horizons of some decades.

10.2 Multitude and inconsistency of government's objectives

Formulating the objectives of the agricultural development program is the responsibility of the government. But the government wants to have the majority support of the political leaders in providing directives. Therefore it has the tendency to start a multitude of objectives simultaneously, which all too often appeared inconsistent.

For instance, in the case of the resettlement program, there may be a difference in medium and longer term objectives. On the short run, the resttlement projects should alleviate as much as possible the population pressure on land in Java by transferring a large number of peasants to the less populated areas of the Outer Provinces, especially Sumatra. By doing this, the government would like to achieve also longer term political objectives, e.i. in creating a more homogenous Indonesian nation and in the meantime to enable the settlers to improve their standard of living as compared with the past. But this plan could give the impression that the government favours the resettled Javanese above the autochthonous population. On the other hand, if the resettled peasants are not helped effectively, the government could be blamed for transplanting poverty from one part of Indonesia to another and the resettlement project will miss its main objective.

Another example is the case of settlement in Borneo. The government wanted to have a large number of young men, if possible with military training, in such a strategic location. From the point of view of defense, this settlement may be considered important, but from the economic point of view it is far from efficient, as it will cost more than moving people to south Sumatra.

The question arises, what is the primary objective of the resttlement program? As made clear in Chapter 7, it is the alleviation of the population pressure in Java. To achieve that, one of the methods is placing a large number of active persons in the Outer Provinces, with ample land resources. Economically speaking, this should be achieved at the lowest possible cost, as capital resources are very scarce. Thus the mixing of wider objectives with the settlers may be inconsistent with economic considerations. However, to make resettlement attractive, the settlers should be given the opportunity to better their economic position, but not to such an extent that the program would absorb too much personnel and money. This means that much effort of the settlers themselves should be incorporated in the planning of the settlements.

Inconsistency of objectives can also be demonstrated in the case of the rehabilitation of the sugar factories in Java. The main objective of rehabilitation is to earn more foreign exchange and simultaneously raise the agricultural income of the sugar peasants. But as the government likes to secure a cheap supply of sugar, it intervenes with the prices. Hence these peasants are more or less discouraged in their efforts to increase production. The result is that the increased productivity of sugar could not be realized; production even declined.

The same conflict arises in the attempt to increase rice production. To save foreign exchange and to raise the economic situation (especially for the poor peasants) the government wants such an increase. But to avoid political repercussions through higher

food prices, an upper limit has been set for the price of rice, so that the peasants get a low price for their product. Thus the farmer will not expand production by costly inputs, and domestic production did not improve.

With such a multitude of cross-purposes, the government cannot implement any effective program. The result would have been different, if it could single out one objective; but as this could not be achieved politically, the problem is how to harmonize the various objectives and to combine them in an acceptable way.

The economists and other experts charged with planning agricultural development must guide the government by assessing the problems facing the economy, the resources likely to be available in different eventualities, and to stipulate the ways open for development. It is up to the politicians to chose between these alternatives on a rational basis.

10.3 Absence of clear-cut doctrinal concept

The most important objection against the government's agrarian policy is the absence of any clear-cut doctrinal concept as regards the political attitude towards the peasants. This can be explained as follows.

As earlier stated, the success of any agricultural development plan depends on the cooperation of the peasants. Although it is true that the Indonesian government undertakes some farm production directly, either by establishing state farms or by taking over the management of farms and estates formerly privately owned, in most cases agricultural development is still basically the outcome of production decisions by the great number of farmers. Nevertheless, the government's action will be a decisive point in promoting and facilitating production and productivity increases by the farmers on their farms.

The range of measures available to the government to influence the progress of agriculture could have its roots in two alternative doctrinal concepts:

(1) The government's agrarian policy is directed towards the achievement of specified objectives. In that case instruction, sometimes even with harsh and distasteful methods, have to be used to compel the farmers to do the things the government wants. This does not mean that any development in agriculture will be counteracted: such measures, especially when applied with skill, whereby different elements of the rural society are used to destroy the old structure and to develop qualities of leadership and a new attitude of mind, can substantially increase the production. But its achievements can only be accomplished through political authoritarianism. In this concept, the government will decide how to combine land, labour, capital and technical knowledge. The status of the peasant in this case is just that of a labourer simply taking orders from the government.

(2) The other concept is based on the individual freedom of choice in economic activity and of personal decisions. "People make the choice they do in farming as they do in all other things, on the basis of the satisfaction they derive from them.

This satisfaction includes approval by their families, by their friend and by their society. It includes economic gain, it includes a personal achievement, it includes the feeling of being of service to their fellow men and to their country.[280] By this concept the government tries to induce the peasants to employ improved methods not by using force but by using educational methods (extension). This means that the government places full faith in the individual farmer as the producer and manager of his own farm and its services rendered are only for helping the farmer to improve his farm management.

The author would not like to give his comment on the question which concept is economically the better, because according to him the choice is a political rather than an economic one. But for the success of any agricultural development, one or the other concept should be applied consistently.

If we examine the government's measures in the past, they reflect rather a mixture of both concepts.[281] A few cases will briefly illustrate the point.

As to the agrarian policy in the use of improved physical inputs, the government enforces the farmers to use more fertilizers, seeds, and pesticides to meet its objectives to selfsufficiency in rice production. This frustrates the efforts of the Ministry of Agriculture to mobilize the autoactivity of the farmers by convincing them through the Extension Service that the use of fertilizers and improved seeds is profitable.

In the case of plant protection, the government hesitates to apply planting time regulations, as it is afraid that this might create the impression of limiting the peasant's freedom. But on the other hand, it enforces the peasants to use more chemicals through the Welfare Operation Commend (KOGAM).

In order to induce the farmers to increase their rice production, the government, disregarding its low price policy for foodstuffs, from time to time attempted to encourage the peasants to increase their production by creating an economic environment which was more in line with the 'liberal' concept: by paying the peasants a price which was meant to give them incentives to produce more. In doing so the government action did not contribute to a clear understanding of its policy.

As regards the credit policy, on the one hand the government provided credit facilities which aimed to educate the peasants in the efficient use of credit to get them to adopt sound farming practices, but on the other hand, they were forced to accept credit regardless of their need, only so that they would join the Self Sufficiency in

[280] A. T. MOSHER, *Agricultural development*, New York, 1963, pp. 10–11.

[281] This mixture of two doctrinal concepts in the political attitude of the government towards the peasants should not be confused with the mixed system of economic organization, where the government aims for the cooperation of private initiative in certain sectors of the economy. This mixed system of economic organization is based on the philosophy that, wherever private initiative can do the job, the government should sponsor it, and that when private initiative is lacking, the government should do the job itself. It is highly unlikely that in most developing countries private initiative alone will be able to develop the country. Such development demands a favourable industrial climate which is usually lacking in those countries. Therefore, the author's critisism is not against a mixed system of economic organization, but against the ambiguity and inconsistency of the government's measures which find its roots in the application of a mixture of two doctrinal concepts.

Rice Production (SSB) Campaign. Again a mixture of two concepts: the first is to strengthen the development of the individual peasant as a producer and manager on his farm, and the second more to consider the peasant as a labourer only to have the government accomplish its objectives, e.g. to reach selfsufficiency in rice production at all costs.

Considering land policy, we have seen that the government adopted the Basic Agrarian Law of 1960, which put a ceiling on the size of peasant holdings. More or less in contradiction to that, the government, as stated in the same law, began a policy of recognizing individual ownership of the land in order to strengthen the economic position of individual private peasants. It may be that in this concept the ceiling is put at too low a level (as in Japan): "Like the suit once fitted to a rapidly growing child becoming too tight, the land tenure system aimed at the establishment of owner farmers has become unsuitable to the present agricultural situation.[282]

It is evident that agricultural instruction is designed to achieve the objectives for which the educational and training institutions are established. If one examines the curricula of the government agricultural educational institutions, one sees again a mixture of two concepts: the stepping-up of education is combined with political education, especially since 1959. This will help the government to carry out its political education, e.g. to strengthen the concept of 'guided democracy and economy'. This sounds like an enforcement policy to be applied on the peasants ('printah alus').

But on the other hand, the government is not to teach the 'what and how', but also the 'why' of its measures. This seems to indicate its opinion that the ultimate effectiveness of any agricultural development program depends on the ability of the individual peasant. He has to make sound decisions, based on an understanding of the alternatives open to him and in appraising their consequences.

As in the case of education, and in the operation of the research institutes, too, if one tried to introduce the policy of guided economy, this would mean, that the capable and promising young agriculturists would be forced to join the agricultural research institutes. However, the government gave freedom to this people to choose their own job within the various government organizations (banks, agricultural enterprises and the like). Only a few went into the research institutes, the mean reason was low payment.

As regards the institutional programs taken by the government the following could be said. In developing a strong agricultural extension service the conclusion could be drawn that the government is inclined to consider the individual peasant as producer and manager of his own farm. But in this case, too, it contradicts itself by accepting the other concept, namely by forming the KOGAM which enforces the peasants into doing certain things to meet its objectives.

In the case of establishing credit institution, the government's activities are directed towards setting up agencies which encourage the use of agricultural credit associated with the widespread adoption of sound, improved farm management practices.

[282] Japan, FAO Association, *A strategy for new agriculture*, Tokio, 1962.

But it mingles this case with the second concept. The created paddy centers, are among others (as explained earlier), designed to provide each farm with a credit regardless its need.

The government has taken great efforts to encourage the establishment of agricultural producers' cooperatives. This could be explained as a first step to collectivize peasant agriculture through partial collective ownership of means of production. But in the Basic Agrarian Law of 1960, private ownership of the land is guaranteed, which seems to indicate that the government also encourages the concept of individual peasants ownership. Again a mixture of two concepts.

The non-existence of a clear-cut concept of the government's agrarian policies as regards its political attitude towards the peasants is not limited to the rice growers just mentioned. It also includes government measures to increase sugar production, and the organization of agricultural settlement in the Outer Provinces as well.

There were times when peasants were not subjected to governmental regulations in planting and selling of sugarcane and sugar. But as the sugar factories did not produce cane themselves, the government intervened in this matter. The peasants are compelled to plant or sell cane to sugar factories for a relatively low price to insure the government of a cheap supply of sugar for domestic as well as for export purposes. Again an example of a mixture of two concepts.

The government has great hopes for agricultural resettlement-projects to relieve the population pressure on Java. But as it has no clear-cut concept as regards the political attitude towards the resettled peasants, the execution of these projects has been one of trial and error. Consequently, no consistency could be seen in the organization of the agricultural resettlement projects, the acreage per settler and the conditions of tenure in the government's agricultural resettlement schemes.

10.4 Concluding remarks

The lessons to be learned from these examples of non-existence of any clear-cut concepts is that the government has failed to imbue the peasants with a sense of confidence and purposefulness in the execution of agricultural programs. As long as the government's agrarian policy does not succeed in fulfilling cherished objectives of the peasants, any agricultural development will be a failure. Thus it is necessary that there has to be an identity of purpose and a common responsibility for the government and the peasants to reach with greater security than up till now a joint achievement of purposes. Only then will the potential energy of the peasants be actually released.

This kind of problem is a basic one not only faced by the Indonesian government but also by many developing countries in the world today. Although it is understandable that the Indonesian government hestitates to make a choice between the two concepts, due to circumstances explained in the section on political instability, yet there is no other way out than to accept one clear-cut concept for the execution of its program.

In summarizing we can conclude that there are still many obstacles to overcome before Java can launch rapid agricultural development on a large scale. But, it has to be realized that even if Java can achieve rapid agricultural development, it still will not solve its ultimate problems. Java must be industrialized. But industrialization in Java alone will be more difficult if it is not integrated in the economic development for the whole of Indonesia. Java and the Outer Islands have historically developed in such a way that both are vital and necessary components of one symbiotic economic system. How this system could be the best developed will be briefly discussed in Chapter 11.

11 Prospects for the future

11.1 The inability of peasant agriculture in Java to absorb the population increase

Planning agricultural development is more or less a matter of speculation. But one thing is quite clear: in Java this development is dominated by the problem of population growth.

As already stated, since about 1840 until 1930 the agricultural sector was able to absorb 1% of the total population growth or 1,5% of the growth of the agricultural population. That agricultural expansion kept up with this 1.5% has been possible by the increase in arable land, the intensified use of the land through double cropping (irrigation), the introduction of new crops, and the establishment of large-scale agricultural enterprises. Although the peasants' economic position during that period did not deteriorate (even a slight improvement between 1900 and 1930 has been reported) yet the resources for further expansion became more and more exhausted.

Next it must be pointed out that during that period agricultural and non-agricultural employment developed along parallel lines, both showing an annual employment increase of 1.5%.

In the period between 1930 and 1953, the percentage of agricultural population in Java decreased from 68.1 to 60.5%. This was partly due to factors like war, revolution and agricultural resettlement in the Outer Provinces, but mainly to the expansion of petty trading, government jobs and manufacturing industries: in absolute figures 1.7, 1.3 and 1.8 millions, respectively (see Table 134). This favourable structural change did not continue and the percentage of agricultural population has increased again to 71.9% in 1961. This demonstrates that since 1953 non-agricultural employment did not expand in proportion with the population growth and that agricultural resttlement in the Outer Provinces had not been able to cause a substantial relief in the population pressure in Java.

Political instability and the declining economic situation during the last decade have reversed the favourable trend of the previous period. This induced a process of re-ruralization, the 'trek' to the rural area, as people hoped to find a living by falling back on the traditional village and family ties. If the level of living of the peasants in Java at least should be kept constant, then the natural agricultural population increase of 2.3% (or about 1 million people annually) as indicated by the last figure of the Central Bureau of Statistics, requires the creation of additional employment for 235,000

families per year.

All these calculations are based on the assumption that in the short run, counting on results of direct demographic policies as birth control (which the government has not yet found necessary to pursue in an all out and effective manner, anyhow) is unrealistic.

But is must be realized that the absorptive capacity of the agricultural sector with the present combination of factors of production has already surpassed its limit. Even different proportions in the allocation of the agricultural resources will have no immediate significant effect. To show this, various measures have to be considered; they may be listed as follows:

(1) To increase the area of arable land in Java.
(2) To raise the productivity of the arable land by increasing the rate of double cropping in constructing new irrigation works.
(3) To improve the existing irrigation works.
(4) To intensify the cultivation of existing farms by means of inputs other than improved irrigation.
(5) To change the cropping pattern from less labour intensive to more intensive crops, e.g. conversion of lowland large-scale enterprises to peasant agriculture.
(6) To decrease the average landholding.
(7) To rehabilitate the estates.

As to the *expansion of arable land* in Java, a study of the State Planning Bureau estimated that the island can still supply about 200,000 ha of new arable land, at most enough to absorb the agricultural population increase of one year. But it will be technically

Table 134. Employment structure by industries in 1930 and 1953.

	Millions of employed persons		% of total employed persons		Increase (+) or decrease (-)	
	1930	1953	1930	1953	in % of total employment	in % of sectoral employment
Agriculture	14.3	19.1	68.6	60.5	-8.1	+ 33.6
Non-agriculture:						
mining	0.1	0.1	0.3	0.2	-0.1	0.0
manufacturing	2.2	4.0	10.5	13.3	+2.8	+ 81.8
communications and transport	0.3	0.8	1.5	2.7	+1.2	+166.7
trade	1.3	3.0	6.2	10.0	+3.8	+130.7
free professions	0.2	0.2	1.0	0.7	-0.3	0.0
government	0.5	1.8	2.4	6.0	+3.6	+260.0
other employment	2.0	2.0	9.5	6.6	-2.9	0.0
total non-agriculture	6.6	11.9	31.9	39.5	+7.6	+ 80.3
Total	20.9	31.0	100.0	100.0		

Source: State Planning Bureau (see Table 120), p. 69.

very difficult to realize this expansion and the costs will be extremely high, so that it is doubtful if this measure is economically advisable.

The possibilities of *extending the area of irrigated fields by new irrigation works* are practically exhausted as the economically more favourable areas are already occupied by sawahs. But it could still be possible to build more large irrigation works, eventually as multipurpose projects. It has been estimated that by this measure about 500,000 ha of peasant agricultural land can be brought under irrigation, which would make possible the growing of more than one crop per year.

However, with regard to its practical implementation, the following reservations have to be made. The realization of the irrigation of these 500,000 ha depends for an important part on the speeding up of the execution of the multipurpose projects, and it is the power generation part which may economically justify the execution of these expensive projects, so that irrigation purposes plays a less important role. In addition the improvement of the irrigation will be spread over a rather long period.

It should further be understood, that these multipurpose projects present a number of difficulties which have to be solved. They will be encountered in the mutual adjustment of agricultural and non-agricultural interests, such as the use of the water for irrigation, the demand for a regular water stream for power generation, the supply to cities and industries and the need of flood control. Further, as much foreign exchange is needed for these projects, it will be difficult for the government to finance them, unless foreign assistance can be found.

It is to be expected that only about 180,000 ha can be brought under irrigation by the completion of the Djatiluhur project in 1967. The other two multipurpose projects are still in the surveying stage as shown under 9.1.2 and it will take many years before they will be finished, even if sufficient funds can be found.

It should be kept in mind, that this measure will not add any significant employment opportunity to the men on this land. But the farmer who tills this land now will benefit and the agricultural production will increase.

The *improvement of existing irrigation works* will enable the peasants to make fuller use of their land and their labour. However, this improvement will not provide additional agricultural employment as the farms in Java are already overcrowded. Given this restriction, these measures will solely improve the economic position of the people already on farms and increase their buying capacity for industrial products and services.

The possibility of *increasing yields by the introduction of other improved agricultural techniques,* like seed selection, fertilization, combat of plant diseases and pests, still presents important opportunities. But neither this development will provide additional agricultural employment on the farms. Nevertheless all possible efforts should be made to improve the economic position of the present peasants, as this will add also to the improvement of the national economy.

It is obvious that the success of transformation of peasant agriculture needs the understanding and the cooperation of the farmers. Whatever the government plans to do in a short period, it is likely that the thorough transformation of peasant agriculture required to produce radically improved performances, will take much time. Yet in view of the pressure of population growth and the developing industrialization, it is obvious that peasant agriculture should be improved as soon as possible within the present economic organization.

Thus, on the one hand the desperate urgency to increase agricultural production as quickly as possible and, on the other hand, the need for further study and experience (of the physical, economic, educational and organizational factors involved) before launching big agricultural projects, present a dilemma to the government.

It hardly needs to be repeated that the accelerated expansion of food production is one of the most complex problems which Java has to face. It is not merely a question of greater investment in agriculture or of enlarging the supply of current inputs, such as fertilizers and improved seeds, but creating social and institutional conditions under which the peasant can develop adequate incentives to raise the productivity of his land is equally important.

Under the present conditions, agriculture can largely be developed by activitating the peasants. For this purpose a well-organized extension service is essential, so that a better use of the existing resources will be realized without major capital investments. The cost of such a service can be estimated at only $ 2 per ha per year. As in this program about 8,000,000 ha of peasant land is involved, $ 16 million investment is needed annually. Because no figures are available it is not known exactly, what the benefits resulting from this investment will be in the short run. But in the long run, present efforts to increase productivity of peasant agriculture may prove to have been the right approach and may lead to an economic progress as experienced by other countries like Japan.

The *conversion of lowland estates into peasants agricultural land* will be of limited value because it will create additional employment for only about 200,000 families. This is based on the following facts:

(1) The acreage of lowland estates on Java is only 200,000 ha.
(2) The average worker per ha lowland estate is 0.7 and that of peasant agricultural land is 2.5.
(3) The number of workers per peasant family is 1.8.
(4) On these converted lowland estates land the same average worker per ha (namely 2.5 persons) can be employed as on the peasant agricultural land.

This means that this conversion is perhaps just sufficient to absorb the agricultural population increase of one year. But it should be realized that the loss of the money income and foreign exchange earnings derived from those estates will probably be far more serious than the relief is helpful.

Another possibility of course is a *further reduction in the average size of landholding* by redistributing the existing land. It is evident that this would result in a further decrease

in the standard of living in the rural areas which would cause a serious political and sociological impact on an already precarious situation.

In the author's opinion the reverse is needed, i.e. the increase of the average size of the farms, as with the present size the Javanese farmer is actually a peasant with extremely limited opportunities.

The prospects for the *rehabilitation of estates* are not favourable, as shown earlier in this study. Only rubber production showed an increase after World War II, but in the last years this product has declined too.

Mainly political factors prevent the estates from making their full potential contribution to economic development. Although most of them are nationalized, which eliminated the conflict between indigeneous labour and foreign capital, still some political parties want to divide the estate land amongst the farmers, especially in the lowlands.

At the moment there are too many workers on the estates. To increase labour productivity, part of these workers should be dismissed, but this is forbidden by the present law. Moreover, also under pressure of labour unions, higher wages and welfare benefits are paid to the labourers than in the past, which substantially increased production costs. Unless all these political problems are solved, the rehabilitation of the estates will be very difficult.

Summarizing it can be said, that the future economic position of the population of Java looks rather dark if it continues to increase at the present rate, and it is understandable that the government considers the solution of this problem to be of the utmost urgency.

It is possible that increasing the productivity of the land could provide a living within the sphere of the peasant community, for instance by means of worksharing for a certain number of persons and in the meantime could stabilize the standard of living in rural areas at the existing level. However, this would only absorb a relatively small number of people. While the process of increasing the productivity is a rather slow one, it is more realistic to base plans on the following figures.

A solution of Java's population problem requires that the 1,600,000 persons or 360,000 families added each year to the population should be absorbed elsewhere in the economy (the non-agricultural sector in Java and the Outer Provinces, and the agricultural resettlement projects and agricultural enterprises in the Outer Provinces) to avoid a further decline in the level of living. Finally, it should be important to explore if a direct demographic policy could be applied to slow down population growth.

Some Indonesian development economists expect much from the expansion of non-agricultural employment in Java while others have great hopes of an increased resettlement of Javanese in the Outer Provinces. The author is of the opinion that both measures should be simultaneously applied, because it will be technically impossible to absorb the great number of persons by only one method.

11.2 Expansion of non-agricultural employment

Assumed that non-agricultural expansion, except in government jobs, could follow the same path as indicated by the development in the years 1930–1953, being about 4% per year, with an ultimate number of 7.8 million workers, then their employment sources could absorb about 320,000 workers (about 205,000 families) per year assuming that the number of workers per family is distributed as follows:

Industrial enterprises	1.25
Cottage industry	1.50
Other non-agricultural employment	1.70

The State Planning Bureau's employment survey indicated that 40% of the expansion of non-agricultural employment can be attributed to the manufacturing industry, the remaining 60% to other non-agricultural employment. Then industrialization could absorb about 95,000 families. Assumed that the proportion of cottage industry is 60% of the total industrial employment (as indicated by the Bureau of Statistics), then 57,000 families could find employment in cottage industry each year, and the other manufacturing industries could provide each year new employment for 38,000 families. Thus distribution of possible employment in the non-agricultural sector could be as follows:

Cottage industrial sector	57,000 families
Other industrial sector	38,000 families
Remaining non-agricultural sector	110,000 families
Total	205,000 families

This means that each year from 360,000 families added to the total number, about 155,000 families must be employed outside Java.

11.3 Resettlement in the Outer Provinces

Assumed that indeed the resettlement in the Outer Provinces absorbs about 155,000 families (650,000 persons) each year, then in the near future the population growth in Java would be limited to about 1,000,000 persons annually, though this number will substantially increase again later on.

If younger couples, for instance families consisting of parents with one child, or even better young childless couples, could be transferred, the effect on the future growth of population in Java would be much greater, and it may then be realistic to assume that the annual population increase of 1,000,000 people will be maintained during a much longer period, say up till 1980. This would give the government a breathing spell to reconstruct the national economy in such a way that it would

create the necessary conditions for a rapid increase in farmers' income afterwards and also favourably affect future economic growth of the country.

In 1966, according to DE VRIES, due to the deteriorating economic situation, the number of spontaneous migrants to the Outer Provinces increased considerably and reached a total number of about 250,000 persons in that year. This number, though encouraging, is still insufficient to solve Java's population problem and it is doubtful if it could be continued at the same rate. Ways must be found to resettle at least about 650,000 persons annually to the Outer Islands, as indicated above.

Thus it is obvious that, accepting these cold facts, resettlement in the Outer Provinces cannot become a means to improve simultaneously the economic position of the Javanese settlers as compared with their present position. This has always been an addition goal of the resttlement policy up to now, but for the time being it can hardly be expected. Resettlement projects should be directed first of all to provide the maximum employment for the surplus population in Java.

Assuming that 25,000 families could be absorbed by the non-agricultural sector of the Outer Provinces, then agricultural resttlement should absorb 130,000 families of average size. If agricultural resettlement is to be increased to such an number, spontaneous transmigration in particular should be encouraged to lower the cost, (which amounted to $ 200 for moving one family in 1953).

In the author's opinion, this spontaneous transmigration should be the ultimate aim for all migration. However, it will be necessary to set up first of all nuclei in settlement areas to which the spontaneous transmigration should be directed.

The task of the government would then be to demarcate the right areas, to develop the nuclei settlement areas with selected settlers, and to construct around these nuclei the necessary infrastructural works and to provide the required personnel and services to make the whole organization work effectively at lowest possible cost.

For the *demarcation of the areas for spontaneous transmigration* it should be remembered that, according to the State Planning Bureau (see Chapter 7), there are about 4,500,000 ha of land available suitable for agricultural resettlement projects, scattered over the various islands of the Outer Provinces. If the government allocates 2 ha for each family, this is thus sufficient for 2,250,000 families, enough to cover the needs for about 20 years (calculated on 80 % of the settlers to be farmers).

These lands should be opened first to settlement. Priorities should be given to areas which can be integrated into the overall development plans of the country, like those close to the Asahan Development Project in northern Sumatra and the Sumatra Highway. In the meantime the government could look for other suitable areas.

The *development of the nuclei settlement areas* has to be based on units of 100,000 ha, of which 10 % or 10,000 ha could be cleared at the expense of the government, while the rest could be cleared by the settlers themselves. This 10,000 ha will be the nucleus of the resettlement project while the remaining 90,000 ha will be given to spontaneous

settlers, where the government could provide the necessary services to make farming a success.

Within these 10,000 ha, about 3,000 ha may be cleared simultaneously with the opening up of the area with roads (which has to be done mechanically), while the remaining 7,000 ha can be carried out by the settlers of the nucleus area in paid labour.

Since there are 4,500,000 ha land available, the government has to open 45 nuclei as soon as possible.

Some resettlement areas are less suitable for food crops because of the edaphic or climatologic circumstances. Here the cultivation of perennial crops like oilpalms is suggested, and the possibility to establish agricultural enterprises in combination with resettlement should be explored.

As to the selection of the settlers, especially for the nuclei, it is advisable to choose (as in most parts of the world where new soils have been brought into cultivation) people who possess the right pioneer spirit and are prepared to accept the hardships which go with the clearing of virgin land. The settlers of the nuclei should, if possible, be also experienced dry-land farmers.

In the *construction of the necessary infrastructural works* the government agencies involved with the resettlement projects have the task to assist the spontaneous settler in the following subjects:

(a) To make available land for agricultural settlement. The clearing of the land and building of houses should be done by the settlers themselves, with assistance of the government for some necessities.
(b) To help with the transport of the settlers, especially by providing sufficient shipping facilities.
(c) To construct the infrastructure necessary for a smooth spontaneous settlement. As regards schools, hospitals, rural roads and the like, experience shows that the government can make a go with rudimentary facilities for a start which can be improved later when the returns of farming begin to come in.
(d) To assist the settlers in their farming practice (by efficient extension services) and to ensure the necessary climate to make production attractive and succesful by provid ing seeds, tools, livestock and ready markets for their products.

The cost of a 10,000 ha agricultural resettlement with the above mentioned setup in mind may be estimated as follows:

Mechanical clearing 3000 ha of land including construction of the infrastructure	$ 2,000,000
Clearing 7,000 ha of land by the settlers themselves	$ 210,000
Transport and other costs for the settlers of the nucleus area	$ 500,000
Total	$ 2,710,000

If it is possible to open up in 3 years 45 nuclei areas totalling 450,000 ha, the cost up to 1970 will amount to about $ 120 million. This will create employment for 225,000 families. But, based on the calculations given earlier in this chapter, it is necessary to

resettle 465,000 families in these three years. So ways must be found to expand non-agricultural employment in Java, in addition to that required for the 615,000 families, for the balance of the 240,000 families. Afterwards, as soon as the nuclei areas are open, an influx of spontaneous settlers may be expected. If the cost of settling one family of spontaneous settlers is $ 120, then the cost of bringing the remaining 4,050,000 ha of the 45 agricultural settlement areas into cultivation will amount to $ 243 million. So the total cost to open 4,500,000 ha for agricultural resettlement projects will be $ 360 million in the coming 20 years.

12 Conclusions

The present study reviews the main aspects of the agricultural development in Java. The main conclusions emerging from it are the following.

1. Increasing productivity of peasant agriculture is of crucial importance in the initial period of economic growth of a country.
2. Therefore, the central problem of agricultural development in Indonesia is how to get peasant agriculture moving in Java, where we face the problem of an already excessive yet still increasing agricultural population. The government has taken several measures to relieve this unfavourable situation, such as:
   (a) To transfer Javanese farmers to the sparsely populated Outer Islands.
   (b) To pay special attention to the rehabilitation of the sugar factories which are mostly under state management.
   (c) To increase the productivity of peasant agriculture by applying more fertilizers, better seeds and other improved agricultural techniques.

But the results have not been up to expectations due to various factors, as will be explained in the following point.

3. In Chapter 10 it is shown that agricultural development in Java has been retarded by the following three main causes:
   (a) The political instability of the country.
   (b) The multitude and inconsistency of government's objectives in pursuing agricultural development.
   (c) The non-existence of any clear doctrinal concept in the government's agrarian policy as regards the political attitude towards the peasants.

Other constraints on recent agricultural growth are:

   (a) The more rapid population growth after World War II.
   (b) The diversion of some economic resources for non-economic development purposes.
   (c) The weakness of the first attempts in comprehensive agricultural planning.

4. It is evident from the study that increasing productivity of the peasant's agriculture on a revolutionary scale requires technical, economical, attitudinal and political transformation of the rural society that cannot be brought about quickly. The transformation of peasant agriculture requires a series of interlocking changes in so many different aspects of rural life that a perspective for a period considerably longer than the eight years anticipated in the Overall National Development Plan 1961–1969 is required.

5. Next, an identity of purpose and common responsibility between the government and the peasants is necessary to accelerate agricultural development.
6. Another important conclusion of the study, which is also stressed by JOOSTEN and others, is that expansion of the markets for the agricultural products is necessary for agricultural development.

   Such an increase would certainly alleviate the situation of Javanese farmers for a time, but ultimately it would not solve their problem. Only if most of that increase can be siphoned off into industrial investment does it seem that the application of more and better agricultural inputs will really contribute something dynamic to the general economic situation. If it cannot be drawn off, it will merely further the process of 'involution', not just in agriculture now, but throughout the whole of the Javanese society.
7. It is also shown that Java's rural economy is simply unable to absorb population growth without falling standards of living. In Chapter 11 it is illustrated that a solution of Java's problem requires that the 1,600,000 persons or 360,000 families added each year to its population should be absorbed elsewhere in the economy, into industries in Java or the Outer Islands, or into agriculture in the Outer Islands.

   Only an effective policy of agricultural resettlement to the Outer Provinces and industrialization could enable Java to provide employment for its annual population increase. Such a policy, vigorously applied and accompanied by an adequate educational program, will give the government a breathing space to reconstruct the national economy. Then it might be obligatory for the government, in order to achieve rapid economic development, to persuade the population to stop looking on the maximum of babies as a 'bliss'.
8. Looking at Indonesia from these perspectives, the final conclusion is that it is unwarranted to expect that economic (including agricultural) development occurs easily and quickly. Accordingly, economic development is a long-term goal and the program to carry it out must be equally long in term.

   However, natural and human resources, climate and location are such that, when the government does succeed to prepare the basis for the 'plane to take off' (to use the familiar metaphor of economic growth as introduced by ROSTOV), it has the potential 'to fligh high and fast'.

Samenvatting

Na de tweede wereldoorlog hebben zich in Indonesië grote veranderingen voltrokken in de export en import van landbouwproducten. In dit verband dienen genoemd te worden de sterke toename van de rijstimport en de dalende betekenis van de uitvoer van andere landbouwproducten. Dit betreft in het bijzonder Java, dat met ongeveer 65% van de Indonesische bevolking slechts 15% van de deviezen opbrengt maar daarvan 65% consumeert. Uiteraard heeft deze situatie allerlei politieke consequenties.

Inmiddels blijft de bevolking op het reeds zeer dicht bevolkte Java gestaag toenemen. Deze toename wordt op dit agrarische eiland voornamelijk opgevangen door de landbouw (of beter gezegd: op het platteland), wat een ernstige bedreiging vormt van het sociaal-economisch bestel en grote gevaren voor een verslechtering van de economie met zich mee brengt.

Deze omstandigheden hebben de regering genoodzaakt tot het treffen van allerlei maatregelen. Er moet echter worden geconstateerd, dat de in de diverse plannen voorziene ontwikkeling van de landbouw bij de gestelde doeleinden is achtergebleven en zelfs, dat de voortbrenging in verschillende sectoren van de landbouw stagneert.

De onderhavige studie heeft tot doel, een analyse te geven van de overheidsmaatregelen om in deze situatie verbetering te brengen, en de oorzaken op te sporen voor het falen daarvan. Gehoopt wordt dat ze bij zal dragen tot de opstelling en uitvoering van nieuwe plannen voor de ontwikkeling van de landbouw in Indonesië, en speciaal op Java.

Het betoog is verdeeld in 12 hoofdstukken, waarvan de beide eerste een inleidend karakter dragen.

Hoofstuk 1 geeft een overzicht van de achtergronden, de doeleinden en de indeling van de studie. In Hoofdstuk 2 wordt in een korte theoretische beschouwing aangegeven waarom de landbouw tot verdere ontwikkeling dient te worden gebracht en hoe dit speciaal geldt voor de situatie in Indonesië.

De volgende drie hoofdstukken (3, 4 en 5) geven een schets van de ontwikkeling van de landbouw in Indonesië vanaf 1815. Hoofdstuk 3 behandelt de ontwikkeling in Indonesië in het algemeen en die van de Buitengewesten in het bijzonder. Hoofdstuk 4 belicht voornamelijk de ontwikkeling op Java en Hoofdstuk 5 de gevolgen van de bevolkingsdruk op de landbouw van dit eiland.

De hoofdstukken 6 tot en met 9 illustreren de methode van aanpak, het beleid en de maatregelen van de regering om het hoofd te bieden aan de moeilijkheden die na de tweede wereldoorlog zijn gerezen. Hoofdstuk 6 behandelt in het kort de opeenvolgende plannen die door de regering zijn gelanceerd voor de ontwikkeling van de land-

bouw. Hoofdstuk 7 bespreekt de maatregelen om de bevolkingsdruk op Java te verlichten door projecten voor nieuwe landbouwvestigingen in de Buitengewesten. Hoofdstuk 8 beschrijft de pogingen van de regering om de export van agrarische produkten op te voeren, waarbij de rehabilitatie van de suikerfabrieken op Java als een voorbeeld wordt gegeven. Hoofdstuk 9 behandelt de maatregelen van de regering on de produktiviteit van de bevolkingslandbouw op te voren, waarbij de nadruk valt om de rijstproduktie.

Hoofdstuk 10 analiseert het falen van het agrarisch beleid bij de landbouwontwikkeling op Java, terwijl Hoofdstuk 11 het oog richt op de toekomst.

De voornaamste conclusies kunnen als volgt worden samengevat (Hoofdstuk 12).

1. Het is van vitaal belang, dat in de huidige fase van de economische ontwikkeling van Indonesië de produktiviteit van de bevolkingslandbouw wordt opgevoerd.
2. Het centrale probleem daarbij is, op welke wijze men de landbouw op Java tot nieuwe initiatieven, en, hoe men daarin meer dynamiek kan brengen. De regering heeft verschillende maatregelen getroffen om dit te bereiken, zoals:
   (a) transmigratie van Javaanse boeren naar dun bevolkte streken van de Buitengewesten om de bevolkingsdruk op Java te verlichten;
   (b) rehabilitatie van suikerfabrieken, die nu voornamelijk staatsbedrijven zijn;
   (c) verhoging van de produktiviteit van de bevolkingslandbouw door het gebruik van meer kunstmest, beter zaaizaad en andere verbeterde landbouwmethoden.

   De resultaten van deze maatregelen zijn echter beneden de verwachting gebleven door verschillende hierna te noemen factoren.
3. Voornamelijk drie factoren hebben de landbouwontwikkeling op Java geremd:
   (a) de politieke labiliteit;
   (b) de verscheidenheid en tegenstrijdigheid van de doeleinden van de regering in het streven naar landbouwontwikkeling;
   (c) de afwezigheid van een duidelijke politieke houding tegenover de boeren in het agrarisch regeringsbeleid.

   Andere remmende factoren zijn geweest:
   (a) de onverwacht snelle groei van de bevolking na de tweede wereldoorlog;
   (b) het gebruik van sommige economische bronnen voor niet-economische ontwikkelingsdoeleinden;
   (c) tekortkomingen van de regering in haar eerste pogingen om een alomvattend en efficiënt plan voor de ontwikkeling van de landbouw op te stellen.
4. De studie toont aan, dat de verhoging van de produktiviteit van de bevolkingslandbouw op revolutionaire wijze een technische, economische, geestelijke en politieke transformatie van de maatschappij op het platteland vereist. Zulke veranderingen, die in elkaar grijpen bij de verschillende aspecten van het levenspatroon, eisen een veel langere periode dan de acht jaar voorzien in het achtjarenplan 1961–1969.
5. Het is noodzakelijk te komen tot een identiteit van doeleinden en een gemeenschappelijke verantwoordelijkheid bij regering en boeren om de landbouwont-

wikkeling te versnellen.

6. Voor de ontwikkeling van de landbouw is een groeiende markt voor landbouwprodukten noodzakelijk, waarop door JOOSTEN en anderen reeds met klem werd gewezen. Een verhoging van de produktie van de landbouw alléén zal zeker het probleem van de Javaanse boer voor korte tijd verlichten, maar niet op lange termijn. Slechts als het resultaat van deze verhoging gebruikt wordt voor industriële investeringen mag men een bijdrage van de landbouw verwachten tot een dynamische ontwikkeling van de algemene economische situatie; zo niet, dan kan alleen een verdere teruggang worden verwacht, niet alleen in de landbouw, maar in de gehele Javaanse maatschappij.
7. Tenslotte wordt aangetoond, dat de Javaanse boereneconomie eenvoudigweg niet in staat is om een verdere aanwas van de bevolking op te vangen zonder een voortschrijdende daling van de levensstandaard. Een oplossing van het Javaanse bevolkingsvraagstuk vereist, dat de ongeveer 1.600.000 personen (360.000 families) die elk jaar worden toegevoegd aan de tegenwoordige bevolking, ergens anders in de economie emplooi vinden: in de industrieën op Java of in de Buitengewesten, of in de landbouw in de Buitengewesten. Een daarop gericht, krachtig beleid, aangevuld met een passend opvoedingsprogramma, zal de regering een adempauze moeten verschaffen om de nationale economie te reconstrueren. Daarbij zal het wellicht mettertijd noodzakelijk zijn, geboortebeperking bij de bevolking ingang te doen vinden.
8. De eindconclusie is, dat het irreëel is te verwachten, dat in Indonesië de economische (en dus ook de landbouwkundige) ontwikkeling gemakkelijk en vlug te verwezenlijken is. Een essentiële verbetering kan slechts op lange termijn worden verwacht, en om dit doel te bereiken moet dan ook ieder ontwikkelingsplan worden opgezet voor lange perioden. Daar staat tegenover, dat de natuurlijke en menselijke hulpbronnen in Indonesië zo rijk zijn dat, als de regering er in slaagt een basis te bouwen voor het "vliegtuig om op te stijgen" (ROSTOV), het land inderdaad de mogelijkheid heeft om "hoog en snel te vliegen".

Selected bibliography[1]

ANONYMOUS	1964	*First national congress on agricultural economics.* Bogor (mimeographed).
BAUER, P. T.	1961	*Economic analysis and policy in underdeveloped countries.* London.
BERBANGSO, A. D.	1955	*Masalah transmigrasi dan beberapa soal-soalnja jang meminta perhatian sepenuhnja.* Djakarta.
BOEKE, J. H.	1953	*Economics and economic policy of dual societies.* Haarlem.
BORTON, R. E. (Ed.)	1966	*Selected readings to accompany getting agriculture moving: essentials for development and modernization.* Two Vols. New York.
BUCHANAN, N. S. and HOWARD, S. E.	1955	*Approaches to economic development.* New York.
Central Bureau of Statistics	1966	*Survey sosial ekonomi nasional tahap pertama (Dec. 1963–Jan. 1964): pengeluaran untuk konsumi penduduk Djawa-Madura.*
CHANG PEI KANG	1949	*Agriculture and industrialization: the adjustments that take place as an agricultural country is industrialized.* Cambridge, Mass.
CLARK, C. and HASWELL, M. R.	1964	*The economics of subsistence agriculture.* London.
DJOJOHADIKUSOMO, S.	1955	*Ekonomi pembangunan: pengantar ilmu ekonomi.* Djakarta.
DJOKO LELONO	1953	*Membuka tanah baru, masalah pemuda dan pembangunan.* Djakarta.
EICHER, C. and WITT, L.	1964	*Agriculture in economic development.* New York.
ENKE, S.	1963	*Economic for development.* Englewood Cliffs, N.Y.
FURTADO, C.	1964	*Development and underdevelopment.* Berkeley and Los Angeles.
GITTINGER, J. P.	1966	*The literature of agricultural planning.* Washington.
GITTINGER, J. P.	1965	*Planning for agricultural development: the Iranian experience.* Washington.
HAGEN, E. (Ed.)	1963	*Planning economic development.* Homewood, Ill.
HIGGINS, B.	1959	*Economic development: principles, problems and policies.* New York.
HOSELITZ, B. F. and MOORE, W. E. (Ed.)	1963	*Industrialization and society.* Mouton, France.
HUIZENGA, L. H.	1958	*Het koeliebudgetonderzoek op Java in 1939–1940.* Wageningen.
JOOSTEN, J. H. L.	1961	Enige aspecten van de problematiek van de landbouwontwikkeling in economisch achtergebleven gebieden. *Tijdschr. Econ. Soc. Geogr.*, febr.: pp. 41–46.
JOOSTEN, J. H. L.	1964	Problemen rond de micro-economische aspecten van de verhoging van de productiviteit van de landbouw in de ontwikkelingslanden. *Economie 28 (10)*: pp. 485–496.

[1] Other references are made in the footnotes.

KAHIN, G. MCTURNAN 1952 *Nationalism and revolution in Indonesia.* Ithaca.

KINDLEBERGER, C. P. 1958 *Economic development.* New York.

LEWIS, W. A. 1955 *The theory of economic growth.* Illinois.

Ministry of Agrarian Affairs 1962 *Peraturan dasar pokok-pokok agraria.* Djakarta

Ministry of Agriculture 1960 *Rentjana 3 tahun produksi beras.* Djakarta

MOSHER, A. T. 1966 *Getting agriculture moving: essentials for development and modernization.* New York.

MOSHER, A. T. 1966 *Training manual for group study of getting agriculture moving.* New York.

MYINT, H. 1964 *The economic of developing countries.* London.

NEUMAN, A. M. DE 1954 Progress of industries and the development plans in Indonesia. *Ekonomi dan Keuangan 7:* pp. 247–255; 332–336; 476–479.

NURKSE, R. 1955 *Problems of capital formation in underdeveloped countries.* Oxford.

PAAUW, D. S. 1960 *Financing economic development: the Indonesian case.* Glencoe, Ill.

PENNY, D. H. 1964 *The transition from subsistence to commercial family farming in North Sumatra.* Unpublished Ph.D. dissertation, Cornell University, Ithaca, N.Y.

ROSTOV, W. W. 1965 *The stages of economic growth: a non-communist manifesto.* Cambridge.

SCHULTZ, T. W. 1964 *Transforming traditional agriculture.* New Haven, Conn.

SELO SOEMARDJAN 1962 *Social change in Jogjakarta.* Ithaca, N.Y.

SIE KWAT SOEN 1961 Aspek ekonomi dan pembangunan sosialisme dilihat dari sudut ekonomi pertanian. *Ekonomi 3 (1–2):* pp. 137–164 (Djakarta).

SIE KWAT SOEN 1962 *Pementjaran penduduk di Indonesia: tindjauan dari sudut ekonomi pertanian. Kongres ilmu pengetahuan nasional II.* Djakarta (mimeographed).

SIE KWAT SOEN 1963 *Indonesia's agriculture: with a special attention to tenure and settlement condition.* Land reform and land settlement symposium, Tjiawi, Bogor, April 1 – May 4, 1963. Djakarta (mimeographed).

SUJUDI, A. 1956 *Djajaloka.* Semarang.

TINBERGEN, J. 1958 *The design of development.* Baltimore.

UN (ECAFE) 1955–9 *Economic bulletin for Asia and the Far East, Vol. 6–11.* Bangkok.

UN (FAO) 1962 *Agricultural commodities. Projection for 1970: special supplement to the FAO commodity review 1962.* Rome.

UN (FAO) 1963–6 *Agricultural planning studies series. No. 1–7.* Rome.

UN 1964–5 *World economic survey 1964.* Part I–II. New York.

USA (Department of Agriculture) 1965 Changes in agriculture in 26 developing nations, 1948 to 1963 *(Foreign Agriculture Economic Report no. 27).* New York.

WHARTON, C. R. jr. 1965 *Research on agricultural development in Southeast Asia.* New York.

WHARTON, C. R. jr. 1965 *Selected bibliography for conference on subsistence and peasant economics.* New York (mimeographed).

WIDJOJO NITISASTRO 1964 *Migration, population growth and economic development in Indonesia: a study of the economic consequences of alternative pattern of inter-islands migration.* Ithaca, N.Y.

ZIMMERMAN, L. J. 1964 *Arme en rijke landen: een economische analyse.* The Hague.

List of tables

Author's index