

Chapter 1: Introduction

1.1 Background

Until it was superseded by manufacturing sectors in 1991, agriculture had been the most important sector of the Indonesian economy in terms of output, although it still contributed around 20 per cent of GDP in that year. The agricultural sector remains the largest sector in terms of employment, contributing around 50 per cent of the workforce. In addition, the agricultural sector plays a vital role as export earners, contributing around 12 per cent of merchandise exports or about 30 per cent of non-oil and non-gas merchandise exports. Also, many of Indonesia's main manufacturing industries are agro-based industries: rubber processing, rice milling, palm oil, clove cigarettes, wood products and plywood, pulp and paper, sugar mills and refineries, and so forth.

The relative decline of agriculture as a share of total output and employment is a central feature of economic development. In the case of Indonesia, the phenomenon of a relative decline of agriculture as a share of total output and employment in the process of its economic development is readily observed. Despite highly successful agricultural development due to 'green revolution' success in Indonesia that increased agricultural yields and production, the Indonesian economy has undergone rapid structural change. In 1960 agriculture accounted for over 50 per cent of GDP and by 1992 this sector's share had fallen to around 20 per cent of GDP. The declining share of agriculture was due mainly to an increasing contribution from manufacturing and services to overall economic output as the country went through a rapid economic transformation. Hill (1995) points out that, by international standards, the decline in agriculture's share of GDP during the 1970s and 1980s was quite high.

Although the share of agriculture declined gradually in the process of development, it does not mean that industrialisation in LDCs causes sustained economic growth. The World Bank (1991) shows evidence that rapid agricultural growth has generally been associated with successful industrialisation and sustained gains in overall output and productivity. Growth in output and productivity is usually lower where agricultural growth is low. Agriculture's declining contribution and slow growth relative to the non-agricultural sector was not, however, the result of unusually poor performance. In fact, during the two decades of the 1970s and the 1980s, agriculture in Indonesia grew at an average annual rate of 3.8 per cent (World Bank 1992). This was well above the growth rate of population

(2.1 per cent) and exceeded that in most other developing countries with similar resource endowments and population pressures (Hill 1995).

The World Bank (1992) estimates that agriculture's share of Indonesia's GDP will decline further to around 15 per cent, and its share of employment to around 40 per cent by the year 2000. Although agriculture's relative decline within the overall economy will continue, the Indonesian government will continue to place importance on further development and improvement of the agriculture sector for economic, social and political reasons. Thus active government assistance to the agriculture sector will continue to support improvement in agricultural production, to increase the incomes of rural population and to reduce poverty.

1.2 Research Problem

Since the mid-1960s, Indonesian agriculture has grown at a relatively rapid rate, although not commensurate with the growth of the overall economy. During 1965-1980 the agricultural GDP growth rate averaged 4.3 per cent per year. During 1980-1990 it declined to 3.2 per cent per year. This slower rate of growth of the agriculture sector was due to the combined effects of lower world commodity prices, a slow-down in the expansion of new areas, ecological limits and increases in cropping intensity, and the near-completion of the green revolution advances for rice (Tabor 1992). In recent years, agriculture grew on average at less than 2.5 per cent only. If the growth rate were unlikely to exceed this level at the end of the 1990s and the beginning of the 21st century, it would dampen overall GDP growth. The agriculture sector could continue to thrive in the future if the government were to accelerate the pace of policy reform and in particular to reduce the disincentives against the sector. The identification of the economic forces which drive the process of structural transformation in the Indonesian economy with emphasis on the agricultural sector in the past may then have some implications for restructuring economic policy in Indonesia for the benefit of the agricultural sector.

One of the most striking features of economic development is structural change, especially during the process of industrialisation. During the process of industrialisation, structural change is associated with the shift from a predominantly agricultural economy to one dominated by the industry and service sectors. The rate of change in a growing economy depends fundamentally on a dynamic change in external environment, natural resource endowments and domestic (national) policies which are designed to resist, retard or promote change. The relative decline in the agricultural sector's contribution to the overall economy is not necessarily harmful to the economy if protectionist and distortionary

factors, both from domestic and external environments, do not adversely affect the ability of the agricultural sector in response to competitive pressures. However, the relative decline of the agricultural sector in Indonesia was hastened by the higher levels of government assistance to the manufacturing sector compared with the agricultural sector and other domestic and external policies that had distortionary and efficiency effects. These unfavourable factors would have expedited the decline of Indonesia's agricultural sector.

In regard to agriculture, the economic development process is viewed as a major structural transformation from an agrarian economy to an economy in which the share of agriculture in the production and employment structures of the economy declines with major increases in national income and employment. The transformation of agriculture from a traditional into a modern sector occurs together with significant changes and output growth in the entire economy. This structural shift influences the transformation of traditional agriculture by enabling farmers to acquire more inputs from non-agricultural industries (e.g. hybrid seed, chemicals, fertilisers, machinery and advisory specialists) and by creating greater demand for off-farm services such as transportation, storage, handling, processing, commercial and financial services. Such interdependence has been increasing over time (Powell 1990). The relative contributions of agriculture to the economy have tended to decline over time partly because of this increasing amount of interdependence among industries. Thus, the interdependence among industries or interindustry relationships represents one force behind the expansion of agricultural production through domestic demand, technological change and trade which stimulate the production of important agricultural input requirements and off-farm services. The existence of patterns of change in interindustry relationships in the process of structural transformation within the economy deserves scrutiny.

The structural transformation of an economy during the process of industrialisation raises many important questions. Two of them are presented here. The first is about the sources of the shift in the role of individual sectors, and the second is about the role of economic policy.

The answer to the first question can be found by applying demand and supply analysis. Economic development and structural change result from the interaction of supply and demand factors. Two sets of causal forces have been cited as important in explaining the occurrence of structural transformation: (a) changes in patterns of intermediate and final demand and (b) changes in supply factors including the accumulation, efficiency and advancement of production factors such as labour and capital. Economists have tended to examine either supply or demand factors in isolation, although economists realise the need

for a simultaneous examination of both supply and demand factors to understand the mechanism of structural change in the economy. There have been no studies to date dealing with this issue satisfactorily. A pioneer study by Solow (1957) concentrates on supply conditions in attempting to explain changes in the structure of production. In such a 'sources of growth' study, aggregate and sectoral production functions are first estimated and the contributions of various factor inputs in accounting for output growth are then calculated. Another set of studies, inspired by Chenery (1960), attempts to explain structural transformation by decomposing changes in sectoral output into four sources: domestic demand growth, export expansion, import substitution and changes in input-output coefficients.

In the first part of this study, the conventional approach will be followed to analyse some aspects of the process of structural change during Indonesian economic development and is concerned primarily with the role of agricultural activities in that process by applying the input-output decomposition approach. This study will consider some important questions: what are the key factors affecting growth and change in the Indonesian economy, what are the key factors affecting growth and change in the Indonesian agricultural economy, and what are the typical patterns of growth and decline in Indonesian agriculture in relation to other sectors of the economy. This will be done by analysing the structural change in terms of output and employment in the context of the Indonesian experience from 1971 to 1995.

The input-output decomposition approach starts from an accounting identity of demand and supply and attempts to explain differentiated growth of sectors over time. By using input-output analysis, changes in output can be broken down into changes in four demand factors: domestic demand expansion, export demand, domestic supply ratios and changes in input-output coefficients. Domestic demand are influenced by changes in consumption by households and government, in capital formation and in net stock accumulation. Intermediate demands are influenced by changes in input-output technical coefficients, or supply by changes in production technology over time. Changes in domestic supply ratios are changes in the proportion of total supply provided from domestic sources instead of foreign sources. The input-output decomposition approach suffers from its use of a simple accounting framework for evaluating the causal forces that explain structural change. Later in the other part of this study, this approach will be extended to a more sophisticated general equilibrium model, where the interdependence between demand-side and supply-side causal forces is explicitly modelled.

The second question is more difficult to answer. The causes of the decline in the agricultural sector are not generally policy variables, but most of them are subject to

policy influence (Martin and Warr 1994). To distinguish exactly the effects of endogenous and exogenous economic forces on the one hand and of governmental policies on the other, however, is difficult if the demand and supply analyses are conducted in isolation. An attempt needs to be made to separate the effects of Indonesian domestic economic policy and other exogenous effects. The Computable General Equilibrium (CGE) model developed in the second part of this study simulates the workings of an economy in which prices and quantities adjust to clear markets for products and factors. The relative prices then play an important part in CGE models, but the input-output models used in the first part of this study do not include an explicit role of price variables. So the CGE models have the advantage of allowing price changes as one main cause of the decline in the agricultural sector.

It has been recognised that in LDCs agriculture plays a multifaceted role in their overall economic development. Agricultural development supplies food for the growing non-agricultural population, releases labour for non-agricultural production as labour productivity in the agricultural sector increases, provides capital for non-agricultural investment, earns foreign exchange from agricultural exports, and expands the domestic market for the non-agricultural sector. Empirical evidence suggests that there is a more fundamental symbiotic relationship between agriculture and other sectors, to such an extent that when agriculture does well so does the rest of the economy, and vice versa (Timmer 1988, World Bank 1993). The analysis of this set of important links among sectors in the economy requires an economy-wide framework.

Compared with the partial equilibrium frameworks, the economy-wide (general equilibrium) frameworks have several advantages. First, the general equilibrium frameworks provide an adequate theoretical foundation to understand the likely effects of macroeconomic and agricultural policy changes on the agricultural sector and the rest of the economy. Secondly, the general equilibrium frameworks can better capture the intersectoral and macroeconomic linkages of the agricultural sector to non-agricultural sectors, and vice versa. Thirdly, the general equilibrium frameworks incorporate the distinction between traded and non-traded goods. If the linkages and feedback effects between the agricultural sector and the rest of the economy are significant, the use of partial equilibrium frameworks under such conditions is likely to prove inadequate.

Input-Output (IO) analysis is a frequently used tool to evaluate the linkages between the agricultural sector and the rest of economy in Indonesia (Daryanto and Morison 1992, Daryanto and Daryanto 1994, Daryanto and Morison 1995). However, IO models are linear and impose significant rigidities, including the limited role that prices play in production decisions and zero-substitution elasticities in consumption and production.

The IO models also ignore the flows from producing sectors to factors of production (value added) and then to entities such as the government and household sectors and finally back to the demand for goods (Adelman and Robinson 1986). In recent years attention has turned towards more sophisticated models, which have a more complete depiction of sectoral linkages. This kind of model (CGE) allows analysts to relax the IO rigidities while retaining depiction of sectoral linkages by introducing non-linear functions in production and consumption and allowing endogenously determined prices.

The Indonesian government has succeeded in promoting agricultural development that is having a pervasive impact on the development of the entire economy (Hill 1995). In this trade-oriented economy with commodity prices determined in the world markets, the performance of agricultural development and the economy has been subjected to the adverse effects of terms of trade changes. Agricultural policies play an important role in determining prices in domestic markets. By changing the relative prices of traded and non-traded goods, trade policies may have a profound indirect effect on agriculture. This indirect effect is particularly important to recognise in a country such as Indonesia, where the share of agriculture in GDP is high and a large percentage of the labour force is employed in agriculture. Agricultural growth is thus crucial for overall economic development and for improving the welfare of the poor. While there has been some previous CGE modelling of the Indonesian economy, the economy-wide effects of the external shocks and changes in domestic policies on the agricultural sector have not been specifically investigated. It is then worth investigating the impacts of external shocks and changes in domestic policies on the agricultural sector in a general equilibrium framework.

The oil price shocks had significant impacts on oil-exporting countries like Indonesia whose oil revenues shoulder the burden of economic development. A series of adjustments was required to restore internal and external balance. Among other macroeconomic adjustment measures, some development economists argue for the adoption of agriculturally based labour-intensive commodity strategies in response to the world environment with respect to the degree of openness of LDCs' economies to foreign trade.

Development economists such as Mellor (1986), Hazell and Ramasamy (1991), and Adelman (1984) recognised the potential for rural consumption demand to create a mass market for domestically produced goods, both agricultural and manufactured. Empirical results have demonstrated repeatedly that the agricultural and rural sector is an important source of effective demand that can induce industrialisation (Haggblade and Hazell 1989, Haggblade, Hazell and Brown 1989). These considerations, together with the fact that the population in LDCs is predominantly rural, may have made people view agriculture more

stressing the production, income and consumption demand linkages inherent in LDCs, the ADLI strategy attempts to steer a developing economy toward a more equitable and self-sustaining growth path (Vogel 1994). This study focuses on the relevance of ADLI strategies as an alternative development strategy for Indonesia within the context of prospective changes in international and domestic environments.

1.3 Objectives

The main objective of this study is to analyse the patterns of output and employment change in Indonesian agriculture compared to other sectors and to analyse the patterns of output and employment change within agricultural sectors. The identification of the economic forces that drive the process of structural transformation may have some implications for restructuring economic policy in Indonesia. This study will focus on demand-based sources of sectoral output and employment change from 1971 to 1995 as directly and indirectly due to changes in domestic demand, exports, technology, import structure and labour productivity.

This study also utilises a CGE model of the Indonesian economy to analyse macroeconomic agricultural linkages and evaluate sectoral effects of changes in the external shocks and changes in macroeconomic policies on agricultural development performance in Indonesia. The other objective of this study is to analyse existing agricultural development policies in response to the external shocks with a view to finding the ones that generate a more rapid rate of economic growth and a more equal income distribution.

1.4 Hypotheses

There are five main hypotheses to be tested:

- (1) For agriculture, the only sources of output growth are final demand, and the agriculture records positive net effects of trade on output growth.
- (2) For agriculture, the sources of employment growth are final demand and labour productivity.
- (3) The pattern of structural change in agriculture is influenced by changes in the domestic final demand and technological change.

- (4) The external shocks have important consequences for Indonesia's agriculture.
- (5) The agricultural sector would gain from the implementations of ADLI strategy and reduction of agricultural exports and indirect taxes.

1.5 Organisation of the Study

The remainder of this dissertation is organised into the following chapters. Chapter 2 discusses the importance of structural change, emphasising the contributions of authors such as Kuznets, Chenery and Syrquin, the theoretical framework of reasons for agriculture's relative decline, and the main factors in shaping the structural change process.

Chapter 3 describes the Indonesian economy with emphasis on the agricultural sector during the past three decades and also describes the principal policies that affect the sector.

This study uses an input-output model for analysing growth and structural change in the Indonesian economy in the 1970s, 1980s and 1990s. Chapter 4 discusses the input-output framework for examining structural changes and its use in both developed and developing countries. An application of input-output decomposition analysis to the Indonesian economy is presented in Chapter 5.

Social Accounting Matrices and CGE models are reviewed in Chapter 6. In Chapter 7, a variant of the trade-focused CGE model for the policy analysis in this study is described. The CGE model used in this study is called GEMINA (General Equilibrium Model for Indonesia with emphasis on Agriculture).

In Chapter 8, the results of changes in some external shocks and domestic policy experiments conducted using the CGE model are discussed. Chapter 9 presents analysis on the impacts of the current economic crisis on agriculture, policy responses of the government and the relevance of ADLI to address the economic and financial crisis in Indonesia. A revised version of this chapter (Daryanto 1999) has been accepted for publication in the *UNEAC Asia Papers*. The author's contribution to Simmons and Daryanto (1999) is also taken from Chapter 9. Chapter 10 synthesises the results of the study and draws some policy implications for the current agricultural development in Indonesia. This chapter also makes some suggestions for further research.

Chapter 2: Structural Change and the Role of Agriculture in Economic Development

2.1 Introduction

This chapter reviews the literature on structural change and the role of agriculture in economic development. It is organised into 6 main sections. In section 2.2 the importance of structural change, emphasising the contributions of authors such as Lewis, Chenery and Syrquin, is examined. The current evidence on the patterns of structural change in the world economy is highlighted in section 2.3. The theoretical framework of reasons for agriculture's relative decline is examined in section 2.4. The external and domestic policy environments of agriculture are examined in section 2.5. This is followed in section 2.6 by a review of agriculture in theories of economic development.

2.2 Structural Change and Development Patterns

2.2.1 Approaches to Study of Structural Change

Structural change of an economy which is also referred to as economic transformation is defined as a change in the relative weight of significant components of the aggregative indicators of the economy, such as national income (output) and labour force. The structural change is associated with the shift from a predominantly agricultural economy to one dominated by the industries and services sectors. But absolute levels of agricultural output and employment will rise throughout much of the prolonged process of structural transformation.

The connection between economic structure and the level of development has been one of the most extensively explored themes in both historical and cross-section studies. Broadly speaking, there are two different approaches in the literature on structural change.

Examination of structural changes can be pursued from a predominantly historical output standpoint by analysing the actual processes of transformation of a group of countries under similar initial conditions and economic systems and by exploring particular theories by which the process of structural changes that occurred can be best explained. A well-known representative example of such structural-change approach is the 'two-sector

surplus labour' theoretical model of Lewis (1954). According to this tradition of dualistic development model, it is necessary to foster a transition from agriculture to industry in order to stimulate the long-run economic growth of a country. Agriculture is regarded here as the traditional and more static sector of an economy, whereas industry is seen as the modern and more dynamic sector.

The second approach concentrates on the relationship between the agricultural and industrial sectors using inter-country cross-section and/or time-series data of selected countries; Fisher (1939), Clark (1940), Kuznetz (1957), Chenery (1960) and Chenery and Syrquin (1975) are among the most prominent researchers following this approach. In particular, Chenery and Syrquin's work is widely considered to be one of the centrepieces of the contemporary literature in development economics. It provides an elaborate quantitative profile of the changes in the structures of demand, production and trade that a growing economy experiences as its GNP per capita expands from US\$100 to US\$1,000. According to Kravis, Heston and Summers (1978) this range captures the contemporary growth experience from agrarian underdevelopment to newly-industrialised countries. The results are based on econometric evidence gathered from the estimation of regression equations, using pooled cross-section and time-series data for 101 countries for the period 1950-1970. Chenery and Syrquin's work tries to identify universal factors which produce uniformities in structural change across nations, as well as factors like natural resource endowments and trade policies which account for the observed diversity in the economic development experience. Chenery-Syrquin estimated patterns offer descriptive information to identify the many paths to industrialisation which economic history has generated.

Chenery and Syrquin also try to identify some alternative patterns of structural change among countries with different initial conditions and development strategies. Although their study has identified patterns of structural change that are systemic and somewhat uniform across countries, there are factors like country size, natural endowments and trade policies that produce diversity in the patterns of structural change.

2.2.2 Structural Change and Patterns of Development

The patterns-of-development analysis of structural change focuses on the sequential process through which the economic, industrial and institutional structure of a predominantly agricultural economy is transformed over time to permit new industries to replace traditional agriculture as the engine of economic growth (Todaro 1994). In contrast to the Lewis 'two-sector surplus labour' model, increased savings and investment are

perceived by patterns-of-development analysis as necessary but not sufficient conditions for economic growth. Structural change can be thought of as comprising a number of interrelated processes. In addition to the accumulation of capital, both physical and human, the structural change in the patterns-of-development analysis has also been measured by the transformation of the structure of demand, production, trade and resource use as well as changes in socioeconomic factors such as urbanisation and the growth and distribution of a country's population. Then, we are told that with rising income, these variables change over time in a predictable manner.

Chenery and Syrquin's interest in providing a broad-based, panoramic view of the development phenomenon is indicated by their decision to examine as many as 27 structural features of an economy. These can be grouped into 10 basic processes that appear to be essential features of the development. According to the authors, the criteria used in selecting the 27 structural characteristics were theoretical significance, universality, data availability and policy relevance. Using data from 101 countries, Chenery and Syrquin calculated the predicted values of each of the variables at different income levels. The results, what they call the stylised facts of development, are summarised in Table 2.1.

As shown in Table 2.1, the basic processes identified by Chenery and Syrquin can be divided into three groups: the accumulation processes, the resources allocation processes and the demographic and distributional processes. The accumulation processes feature changes in investment (saving, investment and capital inflow), government revenue and education (educational expenditure and school enrolment ratios). Under the heading of resource allocation processes come the structure of demand, the structure of production and the structure of trade. Finally, the demographic and distributional processes are labour allocation, urbanisation, demographic transition and income distribution.

A closer look at the accumulation processes (Table 2.1) indicates that the share of savings and investment in national income increases as per capita income increases. This is due to the rapid growth of the capitalist sector with its higher savings propensity. Capital inflow declines as per capita income increases. This means that the richer the country the less dependent it is on the inflow of funds from abroad to finance investment. Government revenue and tax revenue increase as per capita income increases. Sectors such as mining, industry and foreign investment are more readily taxed than agriculture, and the ability of the government to raise taxes increases with the share of the readily taxable sectors. Finally, during the epoch of modern economic growth, and over the transition range, there is a significant rise in expenditure on education as a proportion of national income and school enrolment ratios.

Table 2.1: Normal variation in economic structure with level of development

	<i>Predicted values at different income levels</i>										
	Mean under \$100	\$100	\$200	\$300	\$400	\$500	\$800	\$1000	Mean over \$1000	Total change	Mid- point
ACCUMULATION PROCESS											
<i>1. Investment</i>											
(a) Saving	0.103	0.135	0.171	0.190	0.202	0.210	0.226	0.233	0.233	0.130	200
(b) Investment	0.136	0.158	0.188	0.203	0.213	0.220	0.234	0.240	0.234	0.098	200
(c) Capital inflow	0.032	0.023	0.016	0.012	0.010	0.009	0.006	0.006	0.001	-0.031	200
<i>2. Government revenue</i>											
(a) Government revenue	0.125	0.153	0.181	0.202	0.219	0.234	0.268	0.287	0.307	0.182	380
(b) Tax revenue	0.106	0.129	0.153	0.173	0.189	0.203	0.236	0.254	0.282	0.176	440
<i>3. Education</i>											
(a) Education expenditure	0.026	0.033	0.033	0.034	0.035	0.037	0.041	0.043	0.039	0.013	300
(b) School enrolment ratio	0.244	0.375	0.549	0.637	0.694	0.735	0.810	0.842	0.863	0.619	200
RESOURCE ALLOCATION PROCESSES											
<i>4. Domestic demand</i>											
(a) Private consumption	0.779	0.720	0.686	0.667	0.654	0.645	0.625	0.617	0.624	-0.155	
(b) Government consumption	0.119	0.137	0.134	0.135	0.136	0.138	0.144	0.148	0.141	0.022	
(c) Food consumption	0.414	0.392	0.315	0.275	0.248	0.229	0.191	0.175	0.167	-0.247	250
<i>5. Production structure</i>											
(a) Primary share	0.552	0.452	0.327	0.266	0.228	0.202	0.156	0.138	0.127	-0.395	200
(b) Industry share	0.125	0.149	0.215	0.251	0.276	0.294	0.331	0.347	0.379	0.254	300
(c) Services share	0.300	0.338	0.385	0.403	0.411	0.415	0.416	0.413	0.386	0.086	300
DEMOGRAPHIC PROCESSES											
<i>6. Structure of trade</i>											
(a) Exports	0.172	0.195	0.218	0.230	0.238	0.244	0.255	0.260	0.249	0.077	150
(b) Primary exports	0.130	0.137	0.136	0.131	0.125	0.120	0.105	0.096	0.058	-0.072	1000
(c) Manufactured exports	0.011	0.019	0.034	0.046	0.056	0.065	0.086	0.097	0.131	0.120	600
(d) Services exports	0.028	0.031	0.042	0.048	0.051	0.053	0.056	0.057	0.059	0.031	250
(e) Imports	0.205	0.218	0.234	0.243	0.249	0.254	0.263	0.267	0.250	0.045	250
<i>7. Labour allocation</i>											
(a) Primary share	0.712	0.658	0.557	0.489	0.438	0.395	0.300	0.252	0.159	-0.553	400
(b) Industry share	0.078	0.091	0.164	0.206	0.235	0.258	0.303	0.325	0.368	0.290	325
(c) Services share	0.210	0.251	0.279	0.304	0.327	0.347	0.396	0.423	0.473	0.263	450
<i>8. Urbanisation</i>											
(a) Birth rate	0.128	0.220	0.362	0.439	0.490	0.527	0.601	0.634	0.658	0.530	250
<i>9. Demographic transition</i>											
(a) Birth rate	0.459	0.446	0.377	0.338	0.311	0.291	0.249	0.229	0.191	-0.268	350
(b) Death rate	0.209	0.186	0.135	0.114	0.103	0.097	0.091	0.090	0.097	-0.112	150
<i>10. Income distribution</i>											
(a) Highest 20%	0.502	0.541	0.557	0.554	0.547	0.538	0.511	0.494	0.458	-0.044	
(b) Lowest 40%	0.158	0.140	0.129	0.127	0.128	0.130	0.138	0.143	0.153	-0.005	

Note: Income levels are quoted in US\$.

Source: Chenery and Syrquin (1975)

The most conspicuous aspect of the change in the structures of demand, production and trade is the declining role of the primary sector. Due to the well-known Engel effect, food consumption as a proportion of total consumption declines. Engel's Law states that the share of food in total expenditure is inversely related to the household's income. Food is the main product of agriculture; therefore a declining share of food in aggregate consumption implies a declining share of agriculture in aggregate production. As the economy develops, the structure of domestic demand changes too. The share of private consumption in aggregate consumption declines relative to government consumption, reflecting the growing importance of the public sector in the economy.

The trade patterns show that the share of both exports and imports grows in the course of the transition. This means that as the economy develops, it becomes more dependent on foreign trade. The pattern of trade also changes, away from exports of primary products and towards exports of manufactures and services. The combined impact of the decline in primary exports and domestic demand for primary goods manifests itself dramatically in the transformation of the production structure. As per capita income increases, the share of primary production declines relative to the share of industry, the share of public utilities and the share of services.

The focus now shifts to a brief examination of the results for the distribution and demographic processes. The shift of labour from primary production lags substantially behind the transformation in the structure of production, and the relative productivity of labour in agriculture declines to about half that in manufacturing. Death rates decline and so do birth rates, though the decline in the birth rate lags significantly behind the fall in the death rate, appearing much later in the transition phase. Finally, the distribution of income worsens initially, partly as a result of the ensuing dualistic character of growth. The share of the poorest 40 per cent of households falls until about mid-way in the transition. Correspondingly, the share of the richest 20 per cent of households rises, before it levels off and declines in the last phase of the transition. The income distribution results roughly conform with the prediction of Kuznet's inverted-U hypothesis.

Chenery and Syrquin's framework of analysis also shows the differences in the timing of the various development processes. The final column of Table 2.1 shows the income level at which the total change is half completed. For example, the transformation in the structures of demand and production reaches the halfway mark by income per capita of \$200, and the change in the trade structure takes place even later in the transition. In general, it appears that accumulation processes occur early, slightly leading the transformation in the allocation processes.

When countries reach income per capita of \$800, the transition is complete in most respects: manufactured exports are about equal in value to primary exports, industrial output is about three times primary output, industrial employment is about the same as primary employment, relative productivities have almost converged and the distribution of income has started to recover.

2.2.3 Stages of Structural Transformation

Chenery and Syrquin (1986) and Syrquin (1988) provide a dynamic extension of the cross-country model, designed to explore the relationship between structural change and the rate of growth. Their findings are illustrated in Figure 2.1.

Figure 2.1 distinguishes three stages of transformation: (1) primary production, (2) industrialisation and (3) the developed economy.

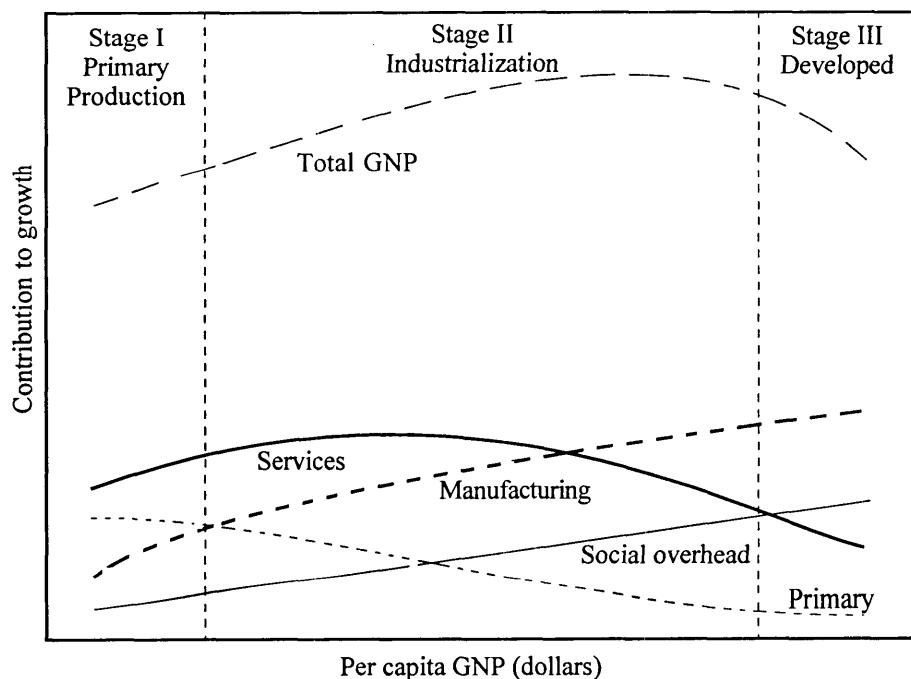


Figure 2.1: Sectoral sources of growth

Source: Syrquin (1988)

State 1: Primary production. This is the stage at which primary activities, principally agriculture, are the main sources of increases in output of tradable goods. This stage is typical of low-income countries, with a per capita income in 1980 US\$ of between \$300 and \$600. The dominance of primary production results in a slow rate of advance capital formation, accelerating growth of the labour force associated with high rates of growth of population, and very low growth in total factor productivity. This eventually leads to a

slow rate of overall economic growth, as can be seen in Figure 2.1. The main reason for a slow rate of overall economic growth is not low investment rates but the absence of productivity growth.

Stage 2: Industrialisation. This stage is identified by the shift of the economy away from the dominance of the primary production towards manufacturing. At per capita level (1980 US\$) of about \$1200, which rises to \$7200 per capita, manufacturing starts to make a larger contribution to growth than agriculture. Contrary to Stage 1, the output of this stage expands rapidly in its capital formation and productivity that added to the overall economic growth, that took place when resources shifted from the primary sector to manufacturing.

Stage 3: Developed economy. This stage has been reached by virtually all industrialised countries. Both the agricultural and manufacturing sectors contract as a share of output and employment, whereas the service sector expands. This phenomenon is usually referred to as de-industrialisation. In this stage, the growth of all sectors is increasingly determined by the growth in total factor productivity and less by the growth in factor inputs. The contribution of capital falls because the capital stocks tend to grow relatively slowly. In addition, because of a slow-down in population growth, there are no significant increases in the labour force. This is a stage of high per capita income (over \$7200 per capita) and the most notable change at this stage is in agriculture, which has shifted from being a sector of low productivity growth to being the sector of highest growth of labour productivity. The underlying cause is the continued shift of labour out of agriculture and the narrowing of the wage gap between agriculture and other sectors, which has encouraged farmers to substitute capital for labour and adopt appropriate technological improvements in the agricultural sector.

The preceding discussion has identified patterns of structural change that are systematic and somewhat uniform across countries. However, various other factors have a systematic effect on resource allocation, affecting the timing and sequence of structural change more than its overall nature. Examination of the nature of an individual country's departures from the average pattern for the group, however, may be even more instructive than the analysis of the average changes that may be expected.

Chenery and Syrquin (1975) and Syrquin (1988) argued that countries proceed through these stages in structural transformation depending on a number of factors such as (1) size of the economy, which is separated into small and large on the basis of population size; (2) openness of an economy, either an inward or outward orientation according to the level of merchandise exports; and (3) trade orientation, to capture the combined effects of the

abundance of resources and trade policy. The index of trade orientation is defined to compare the actual commodity composition of exports to the one predicted for a country of similar income and size. According to this index, countries are classified into primary or manufacturing-oriented.

2.3 Current Evidence: Patterns of Structural Change in the World Economy

Significant structural transformation has occurred in the world economy. As Table 2.2 shows, the share of agriculture to GDP in low-income economies and middle-income economies declined over the period from 1965 to 1994, falling from 41 per cent to 28 per cent and from 20 per cent to 10 per cent, respectively. Table 2.2 also shows that in very low-income nations such as Tanzania more than half of the 1994 GDP originates in the agricultural sector.

During the period of 1965 to 1994, the share of industry in GDP increased from 28 per cent to 34 per cent for low-income economies and from 30 per cent to 36 per cent for middle-income economies. There are similar declines in the share of agriculture in the total labour force, although agriculture remains the biggest employer in developing countries (Table 2.3). Industry employment, however, did not increase as rapidly. In 1965, it comprised approximately 9 per cent of the total labour force in low-income economies and 17 per cent of the total labour force in middle-income economies and in 1994 industry employment was increasing to 15 per cent and 27 per cent, respectively, in low-income and middle-income economies. Tables 2.2 and 2.3 show that, as development occurs, output's share in total GDP and employment's share in total employment increase for both low-income and middle-income economies. In contrast, we have shown that the high-income economies have undergone de-industrialisation. A decline in the industrial sector's share of output and employment has been identified in Table 2.2 and Table 2.3, respectively.

Statistical testing of the relationship between sector shares and per capita income has always produced consistent results on the role of the agricultural sector. For example, Anderson (1987), using cross-section data for 70 countries for 1981 with populations in excess of 1 million, found strong evidence for the negative relationships between the shares of agriculture in GDP and employment on the one hand, and income per capita on the other.

Table 2.2: Structure of the economy: production (percentage of GDP)

	<i>GNP/cap.</i> (1994 US\$)	<i>Agriculture</i>		<i>Industry</i>		<i>Services</i>	
		1965	1994	1965	1994	1965	1994
Selected countries:							
Tanzania	140	46	57	14	17	40	26
Bangladesh	220	53	30	20	18	27	52
India	320	47	30	22	28	31	42
Pakistan	430	40	25	20	25	40	50
Indonesia	880	56	17	13	41	31	42
Philippines	950	26	22	28	33	46	45
Papua New Guinea	1240	42	28	18	38	41	33
Thailand	2410	35	10	23	39	42	52
Malaysia	3480	28	14	25	43	47	42
Australia	18000	11	3	40	30	48	67
Denmark	27970	8	4	32	27	60	69
Japan	34630	9	2	43	40	48	67
Low-income economies	380	41	28	28	34	32	36
Middle-income economies	2520	20	10	30	36	50	52
High-income economies	23420	5	2	40	32	55	66

Source: World Bank (1987, 1994)

Table 2.3: Structure of the economy: labour (percentage of total labour force)

	<i>GNP/cap.</i> (1994 US\$)	<i>Agriculture</i>		<i>Industry</i>		<i>Services</i>	
		1965	1994	1965	1994	1965	1994
Selected countries:							
Tanzania	140	92	84	3	5	6	11
Bangladesh	220	84	65	5	16	8	19
India	320	73	64	12	16	15	20
Pakistan	430	60	52	18	19	22	29
Indonesia	880	71	55	9	14	20	31
Philippines	950	58	46	16	15	26	39
Papua New Guinea	1240	87	79	6	7	7	14
Thailand	2410	82	64	5	14	13	22
Malaysia	3480	59	27	13	23	28	50
Australia	18000	10	6	38	26	52	68
Denmark	27970	14	6	37	28	49	66
Japan	34630	26	7	32	34	42	59
Low-income economies	380	78	69	9	15	13	16
Middle-income economies	2520	57	31	17	27	26	42
High-income economies	23420	14	5	38	31	48	64

Source: World Bank (1987, 1994)

We attempt here to seek empirical verification of the patterns of structural change in the world economy. The empirical evidence supporting this was obtained by estimating OLS (ordinary least squares) regression equations from cross-section data. Using the data available for the year 1992 from the World Bank (1994) for 118 countries, the following equations are estimated (figures in parenthesis are t-values):

$$\ln GDP_A = 6.9375 - 0.5858 \ln YPC, \bar{R}^2 = 0.80 \quad (1)$$

(-21.63)

$$\ln EMP_A = 7.4552 - 0.5768 \ln YPC, \bar{R}^2 = 0.70 \quad (2)$$

(-16.41)

$$\ln GDP_A = 7.8890 - 0.5614 \ln YPC - 0.0142 \ln POP - 0.697 \ln PD - 0.2206 \ln O,$$

(-22.44) (-0.48) (-2.54) (-4.09)

$\bar{R}^2 = 0.84 \quad (3)$

where

GDP_A = share of agriculture in total GDP;

EMP_A = share of agriculture in employment;

YPC = per capita income (at 1992 prices) in US\$;

POP = population;

PD = population density, a crude index of the endowment of natural resources per capita;

O = degree of openness, proportion of exports and imports in total GDP.

A number of striking features emerge from the regression results. First, the negative relationship between the shares of agriculture in GDP and employment on the one hand, and income per capita on the other, are very significant statistically. Second, the share of GDP is negatively associated with population. The estimated relations produced the expected results of a declining agricultural share with rising population, but it is found to be statistically insignificant. Third, a crude index of the endowment of natural resources per capita, represented by the population density of the country, has the expected sign and is found to be statistically significant to explain why agriculture's share in GDP tends to decline. Fourth, the expectation that with rising degree of openness, the share of agriculture in GDP tends to decrease is also met; the coefficient is negative and significant.

Examining regressions (1) to (3) reveals that all coefficients have the predicted signs, and \bar{R}^2 s are high, indicating that non-linear functional forms perform well. The regression results are clearly consistent with the theory of development summarised above.

2.4 Reasons for Agriculture's Relative Decline

It is clear that the relative decline in the economic importance of the agricultural sector is a normal, common and inherent feature of growth in all economies. Analytically, there are two significant forces which cause changes in the structure of an economy: (1) the income elasticity of demand; and (2) the rate of productivity growth.

First, the differences in the income elasticities of demand for non-agricultural products versus agricultural products work over time to the detriment of the developing countries. In essence, as world income grows, the demand for non-agricultural products, which have an income elasticity >1 , rises faster than the demand for agricultural products, which have an income elasticity that is positive, but <1 (this is the essence of Engel's Law). This contributes to the secular, or long-term, deterioration of the terms of trade for the developing countries.

The logic of Engel's Law is captured in Figure 2.2. Consider a frictionless world economy with only two sectors – agriculture (A) and non-agriculture (N). Assume that the economy is growing because of improvements in productivity, and suppose for a moment productivity growth is occurring equally rapidly in both sectors. Then the supply curves would shift out at the same rate, as in Figure 2.2. It is assumed that the two supply curves coincide initially, and hence they would still coincide in the second period after the productivity growth but be further to the right. But because people typically spend a smaller proportion of their increased income (Engel's Law), demand grows less for agricultural products than for non-agricultural products. Put another way, the rate of increase in the demand for agricultural products (D_A) will be less than the rate of increase in the demand for non-agricultural products (D_N). Thus the demand curves are shown in Figure 2.2 to shift to the right at different rates in the two sectors. If the supply curves shift out equi-proportionally and the demand growth for agricultural products is slower than for the non-agricultural products, the output of both sectors rises, but less so for agriculture, and the price of agricultural products would fall relative to the price of non-agricultural products. As a result of this pattern of economic growth, the share of agriculture in aggregate national product falls.

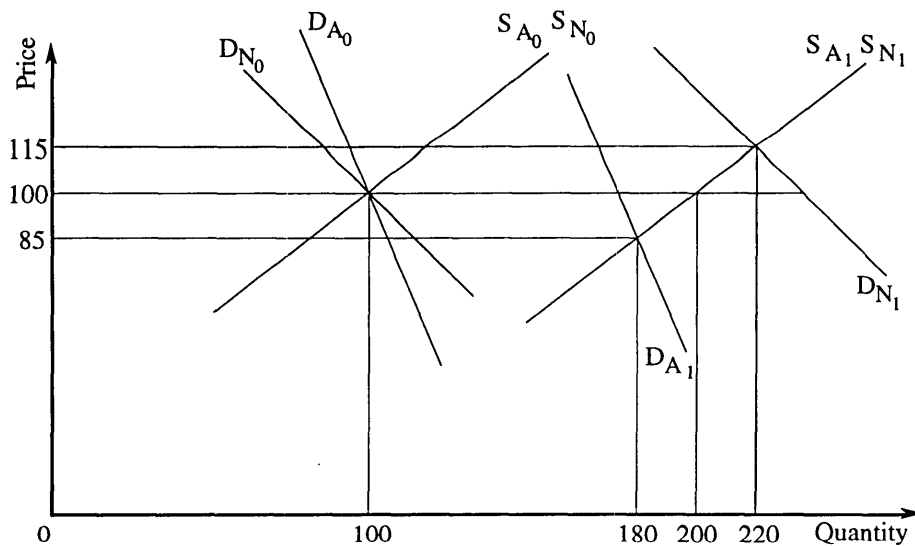


Figure 2.2: Changes in the supply of and demand for agricultural and non-agricultural products in a growing economy, due to Engel's Law

Source: Adapted from Johnson (1973) and Anderson (1998)

In the illustrated example, the price of A relative to N would fall from 1 to $(85/115) = 0.74$, representing a 26 per cent deterioration in the terms of trade for agricultural producers. The agriculture share of GDP would fall from 50 per cent to $(85 \times 180 / (85 \times 180) + (115 \times 220)) = 38$ per cent.

The other main factor contributing to the declining share of agriculture is the different rate of productivity growth. The rate of productivity growth in agriculture in a growing economy is generally much lower than in non-agricultural sectors. If this relationship holds, it can be shown that the share of agriculture in GDP and the terms of trade for agricultural producers would decline over time.

The logic of the effect of Engel's Law and the different rates of productivity growth are captured in Figure 2.3. It is assumed that the two supply curves coincide initially, but in the second period they shift out at different rates. The supply grows less for agricultural products than for non-agricultural products. Thus the supply curves are shown in Figure 2.3 to shift to the right at different rates in the two sectors. The income boost resulting from that productivity growth would shift out the demand curve for each product, but by less for good A (agricultural products) whose demand is less income-elastic. In the illustrated example, the price of A relative to N would fall from 1 to $(85/100) = 0.77$, representing a 23 per cent deterioration in the terms of trade for agricultural producers. Agriculture's share of GDP would fall from 50 per cent to $(85 \times 180 / (85 \times 180) + (110 \times 240)) = 34$ per cent.

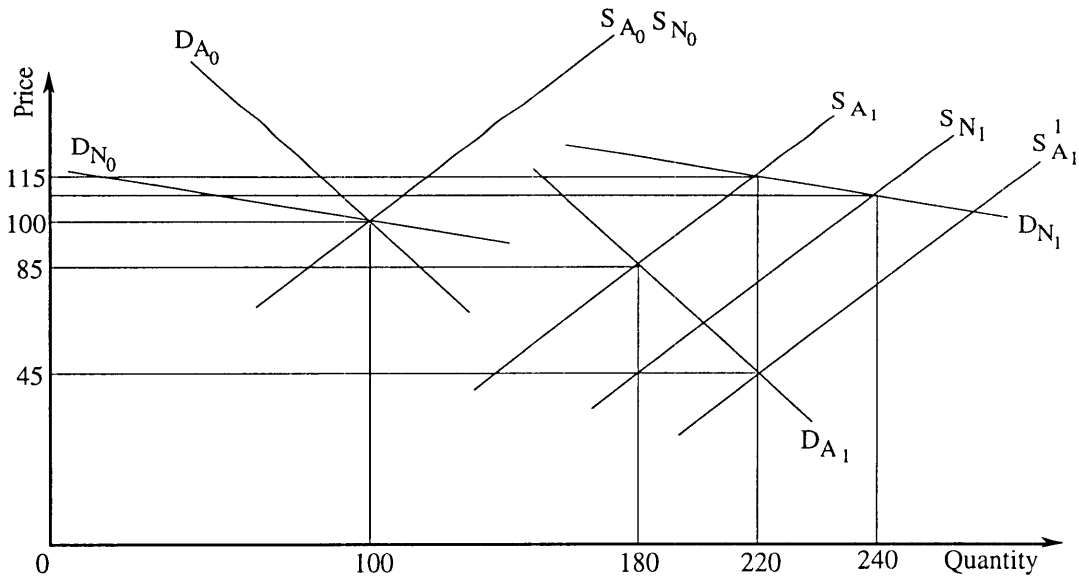


Figure 2.3: Changes in the supply of and demand for agricultural and non-agricultural products in a growing economy, due to the different rate of productivity growth

Source: Adapted from Johnson (1973) and Anderson (1998)

Where the productivity growth rate is growing more rapidly on farms than in non-farm sectors (Anderson 1998), as appears to have been the case in industrial countries during recent decades, the relative price of agricultural products would decline even more. In that case, the lower price elasticity of demand for agricultural products would contribute too. Figure 2.3 shows that if the supply curve for agricultural products shifted from S_{A_0} to $S_{A_1}^1$, then the relative price of agricultural products would fall even more. In the illustrated example, that price ratio would fall from 1 to $(45/110) = 0.41$, involving a 59 per cent deterioration in the terms of trade for agricultural producers.

The above reasoning is also sufficient for explaining the decline in agriculture's share of employment. According to Singh and Tabatabai (1992), labour productivity in agriculture in developing countries was much lower than in all non-agricultural sectors combined and productivity levels were widening over time.

Econometric evidence suggests that total factor productivity (TFP) growth in agriculture is at least as high as in manufacturing. TFP is often defined as the rate of technical progress or that part of economic growth that can be explained by improvements in efficiency rather than the accumulation of factors of production. A study of 14 OECD countries and three developing economies found an average TFP growth of 1.47 per cent a year in agriculture and 1.51 per cent in manufacturing (Martin and Mitra 1993). For the

three developing economies (Argentina, India and Korea), average productivity growth was higher in agriculture (2.5 per cent a year) than in manufacturing (1.9 per cent a year). A study on Thailand found no statistical difference in estimates of TFP growth for agriculture and manufacturing (Martin and Warr 1994), and a related study on Indonesia, Martin and Warr (1993), found a bias in favour of agriculture.

2.5 External Economic and Domestic Policy Environments of Agriculture

Although a secular decline in the share of the agricultural sector characterises a growing economy, accelerating this decline by domestic economic policies that discriminate against agriculture is more likely to hinder rather than reinforce this growth. Price intervention policies play a role in affecting this process of structural change because the trends in the agricultural terms of trade influence intersectoral capital flows. Also, the relative decline in the agricultural sector's contribution to the overall economy is not necessarily harmful to the economy if protectionist and distortionary factors from the external economic environment have not adversely affected the ability of the agricultural sector to respond to competitive pressures.

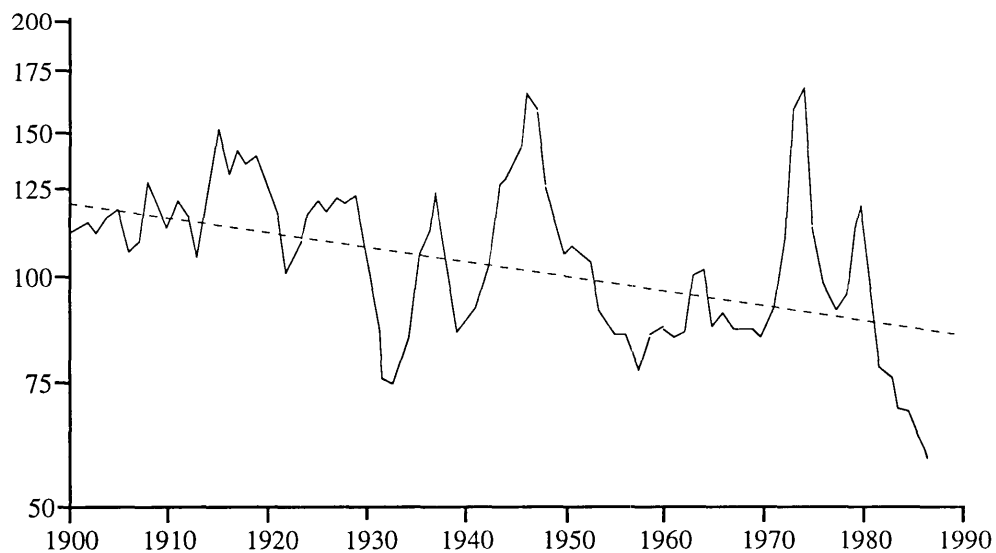
The uncertainties in the external economic environment under which agricultural development has occurred in the 1980s and 1990s are highlighted by three main issues. These are the decline in the world prices of primary commodities, the impact of oil price shocks and the effects of world agricultural trade liberalisation. With regard to the incentives for the sector, it is a stylised fact that many LDCs discriminate against agriculture, whereas the industrialised countries favour their farmers. These trading environments, both domestic and international, are examined in more detail in the next subsections.

2.5.1 The Long-run Decline of Real Primary Commodity Prices

The relationship between the price of a typical units of exports and the price of a typical unit of imports is called the commodity terms of trade. The allegation that developing countries are faced with a secular tendency towards declining terms of trade can be traced back to the influential contributions of Singer (1950) and Prebisch (1950) — hence the nomenclature 'the Singer-Prebisch hypothesis'. The empirical evidence of the long-run trend in the prices of primary products relative to manufactures (the Singer-Prebisch hypothesis) has been subject of debate for almost fifty years. While the issue cannot yet be considered closed, the weight of available evidence strongly supports the view that key

agricultural commodities prices at least have been steadily declining this century relative to product prices.

As shown by Grilli and Yang (1988), during 1900-1986, the decline has been 0.35 per cent annually for food, 0.82 per cent for nonfood agricultural products, 0.68 per cent for cereals, and 0.54 per cent for non-beverage foods. Only tropical beverages have increased in real prices (0.63 per cent per year). The index contained in Figure 2.4 depicts a statistically significant trend rate of decline of about 0.5 per cent per year for the real prices of the traded staple food over the first 87 years of the present century (Tyers and Anderson 1992). This amounts to a cumulative trend fall of some 40 per cent. In addition to a real decline over the long term, it is evident from Figure 2.4 that the relative price of food in international markets has fluctuated substantially from year to year around the declining trend.



**Figure 2.4: Long-term trend in real international food prices, 1900-1987^{a/}
(1977-1979 = 100)**

Notes:

^{a/} An index of export prices in US dollars for cereals, meats, dairy products and sugar, deflated by the US producer price index (primarily for industrial products), with weights based on the importance of each product in global exports, 1977-1979.

Source: Tyers and Anderson (1992)

Other studies (Spraos 1980, Sapsford 1985, Mitchell and Ingco 1993, Tyers and Anderson 1992) continued to support the Singer-Prebisch hypothesis. Spraos (1980) found that from 1950 to 1970, the terms of trade for primary products in relation to manufactured products decreased by 25 per cent. Sapsford (1985) found a 1.2 per cent decline per year in the terms of trade for primary products from 1900 to 1983. Similarly,

Tyers and Anderson (1992) calculated a downward trend about 0.5 per cent per year during 1900-1990 for the traded staples including grains, meats, dairy products and sugar. In a more recent study, Mitchell and Ingco (1993) identified a 78 per cent decline in real world food prices during 1950-1992. As projected by Mitchell and Ingco (1993), the world prices of agricultural commodities for the year 2000 are expected to decline in real terms.

Among the supply-side explanations that have been advanced to account for the long-term price decline are the structural characteristics of world markets for primary commodities and manufactures, the development of synthetic substitutes and the increasing number of developing country exporters (IMF 1987, Fisher 1991, Todaro 1994). The markets for primary commodities in developing countries (the periphery) are highly competitive, so any productivity improvements lead to a price decline. The monopolistic organisation of the labour and capital employed in manufactures production in developed countries (the centre), in contrast, enables the factors of production to reap the benefit of productivity gains in the form of higher income. Synthetic substitutes for commodities like cotton, rubber, etc. act both as a brake against higher commodity prices and as a direct source of competition in world export markets. Todaro (1994) showed that the synthetic share of world market export earnings has steadily risen over time while the share of natural products has fallen. The increasing number of developing country exporters means more abundant supplies and smaller markets for primary product producers. Because demand for primary commodities is price-inelastic, production and export expansion can depress world prices and hence reduce net export revenue. This phenomenon is known as the adding-up problem.

Rausser, Rose and Irwin (1990) found that the domestic support of and protectionist policies towards agriculture in major OECD countries have been partly responsible for surplus commodity production and sagging international commodity prices. Others also viewed the increased supplies by developing countries as being stimulated by the strong foreign exchange value of the US dollar and developing country debt service requirements. Gilbert (1989) found a negative effect of exchange rate appreciation on movements in commodity prices. He also found strong evidence of an increase in supply induced by debt servicing that reduces agricultural food prices.

On the demand side, factors contributing to declining terms of trade are: (a) the income elasticities of demand for agricultural foodstuffs and raw materials are relatively low compared with those for manufactures; (b) developed-country population growth rates are low; (c) the price elasticity of demand for most non-fuel primary commodities appears to be relatively low; (d) international commodity agreements have failed to guarantee

participating nations a relatively fixed share of world export earnings and a more stable world price for their commodity; (e) synthetic substitutes have been developed; and (f) a shift has occurred towards a service society (known as the decoupling hypothesis).

Debate over the terms of trade of primary product producers has raged since Singer and Prebisch published their hypothesis of a long-run downward trend. The early criticisms of the Singer-Prebisch hypothesis were based on statistical issues relating to the quality of the data employed by both Singer and Prebisch. However, subsequent analysis has shown that correction for shipping costs and changing quality would not destroy the empirical support for the hypothesis (Spraos 1980, Spraos 1983).

Recent work by Lipsey (1994) contested the empirical basis of Grilli and Yang's (1988) study. He looked closely at the denominator — the price of manufactures. He found that the long-term trend of the manufactures unit value index could have been overestimated by roughly one percentage point a year because of the failure to take into account three important adjustments. The first adjustment is for quality improvements; because of not accounting for quality improvements in manufactures, the long-term trend of the manufactures unit value index could have been overestimated by 0.5 per cent a year between 1900 and 1992. The second adjustment concerns the prices of manufactured exports to developing economies, which have risen less rapidly than the prices of all exports of manufactures from industrial economies. Adjusting for this could reduce the manufactures price index by another 0.1 per cent a year. The third adjustment has to do with the composition of manufactured exports to developing economies, which has shifted toward higher-quality items within product categories, and adjusting for this account could reduce the manufactures price index by another 0.4 per cent a year over the period 1900-1992. Altogether, these adjustments mean that from 1900 to 1992 the terms of trade for primary products (in relation to manufactured products) increase by about 0.5 per cent a year instead of falling at about this rate. While there may be an element of truth in Lipsey's argument, it should be noted that primary products themselves are not immune to quality changes (Spraos 1980, Spraos 1983, Sarkar 1986, Sapsford and Balasubramanyam 1994).

2.5.2 Oil Price Shocks

The Chenery-Syrquin model offers a framework for analysing growth and structural change in an economy and provides several general empirical results on the subject. A notable feature of the model is its prediction of the direction of structural changes for the large middle income countries, e.g. Nigeria and Indonesia, between the mid-1970s and the mid-1980s. In general terms, the model suggests a decline in the share of agriculture in total

exports and output as income increases; correspondingly, a marked increase in the share of manufactured products in both exports and output would result. In addition, the share of total non-tradable goods sector in GDP would rise substantially with income, and the direction of labour shift would be away from agriculture.

However, the emergence of oil as the predominant sector during the 1970-1984 period in these oil-exporting countries could have introduced additional changes in both the growth and structure of the economy. The 'Dutch Disease' model which accommodates the peculiar de-industrialisation phenomenon associated with an oil export boom thus appears to be more appropriate as an analytical tool for explaining structural change in these economies.

There is a large body of literature that analyses the effects of the 'Dutch Disease' phenomenon (e.g. Gregory 1976, Corden 1981, Gelb 1981, Corden and Warr 1981, Corden and Neary 1982, Warr 1986). The 'Dutch Disease' model argues that a booming sector, such as oil, generates a massive increase in income by bringing additional foreign exchange into the economy. In the absence of a sterilisation policy, the additional foreign exchange from oil exports generates excess demand in all sectors. In the non-booming tradable goods sector (that is, agriculture and manufacturing), such excess demand can be satisfied through importation. But in the non-tradable goods sector, it generates price level increases. The consequent fall in the price of traditional tradables relative to both booming tradables and non-tradables encourages resources to move out of the traditional tradable goods sector into the other sectors of the economy. In other words, the appreciation of the real exchange rate discriminates against the traditional export sectors, manufacturing and agriculture.

The World Bank (1984) found that, contrary to the conclusions of the core 'Dutch Disease' model, the manufactured traded goods sector actually expanded in most developing oil-exporting countries following the oil boom of the 1970s, whereas the agricultural traded goods sector contracted in all cases. In a more recent study, Fardmanesh (1991) integrated the existing 'Dutch Disease' model (Corden 1981) of an oil boom into a reduced-form three-sector model, and estimated it for five developing oil-exporting countries having significant agricultural and manufacturing sectors. He found that the oil boom of the 1970s contracted the agricultural sector and expanded the (protected) manufacturing sector and the non-traded goods sector in developing oil-exporting countries such as Algeria, Ecuador, Indonesia, Nigeria and Venezuela.

There are few studies that directly address the impact of oil shocks on the agricultural sector. An empirical study of the relationship among oil prices, the foreign exchange rate,

and the rural-urban terms of trade in Indonesia provides direct evidence of the importance of macroeconomic policy to agriculture (Timmer 1984). Timmer argued that for Indonesia, an oil exporter, the large increase in oil prices in the 1970s led to an appreciation of the real exchange rate and a deterioration in the rural-urban terms of trade. A higher nominal floor price, a subsidised fertiliser price, a larger investment to rural areas and a big devaluation in 1978 helped overcome the pressures exerted by these exogenous changes on Indonesia's macroeconomy. Without such adequate policy, the appreciated real exchange rate due to the oil bonanza might have seriously limited the expansion of the rural and urban economies.

Timmer (1984) also found that oil prices had a significant effect on the pattern of short-term structural change in agriculture. For a period of five years after an oil boom, he estimated that the agricultural GDP of oil-exporting countries grew by 1.6 per cent per year compared with 2.7 per cent for oil-importing countries. The difference in growth rates was attributed to the lower rate of income growth and improved agricultural terms of trade in the oil-importing countries.

2.5.3 The Effects of World Agricultural Trade Liberalisation

Agriculture remains one of the most distorted areas of world trade with extensive access restrictions, domestic price support or self-sufficiency schemes and export subsidies applying in many products and countries. Apart from the European Union's Common Agricultural Policy (CAP), world trade is also adversely affected by agricultural support programs, such as the US Farm Bill.

The demand for certain LDC agricultural exports is affected by trade restrictions in developed countries. The developed countries are more protectionist of their agricultural than of their industrial products. Whereas LDCs tend to discriminate against agriculture, developed countries tend to support farm incomes. Thus, developed countries have to restrict imports to avoid supporting the whole world price structure. On average in the early 1980s, domestic producer prices in OECD countries exceeded world market prices by about 40 per cent; budgetary expenditures, principally on price supports, storage subsidies and export aids increased massively. According to estimates of the OECD (OECD 1987), such transfers in 1979/81 averaged 32 per cent of the gross domestic value of production of all major commodities in member countries as a group. In a more recent study, these producer subsidy equivalents (PSE) were estimated at 37 per cent in the period 1979-1986 and at 44 per cent in 1990, on average (Wiebelt et al. 1992).

Additionally, non-tariff protection facing both developed and less developed country exports of unprocessed through to processed primary products has grown (Cheeseman 1994). However, in the recently concluded Uruguay Round, it was agreed that existing non-tariff barriers (quotas, embargoes etc.) are now to be converted to tariffs. This means that in 1995, when the Uruguay Round settlement came into force, existing non-tariff barriers began to decrease.

Numerous studies have been undertaken to obtain estimates of the potential impact of agricultural trade liberalisation in industrialised countries. Most of these studies (e.g. Anderson and Tyers 1990, Tyers and Anderson 1992, Goldin and van der Mensbrugge 1996, Winters 1997) have found that trade liberalisation would raise world prices of agricultural commodities and also tend to make them less variable. These studies also suggested that both developed and less developed countries would be better off if food policies were liberalised under the Uruguay Round.

2.5.4 Domestic Policy Environment of Agriculture

Traditionally, the standard approach to agricultural economic policy was to rely on sectoral policies such as agricultural price and credit policies, fertiliser subsidies, food price policies, agricultural research and extension and land tenure. Although the importance of macroeconomic policy for agriculture has been stressed for a rather long time (Schuh 1974, Lipton 1977), rigorous quantitative analyses of those indirect agricultural policies were unavailable until the recent past. One reason for this is the narrow, sectoral orientation of past agricultural policy analysis; another is the widespread misconception that agriculture plays a limited role in economic development (Bautista and Valdes 1993).

Krueger, Schiff and Valdes (1991) provided important empirical findings on the relative importance of direct (sector-specific) and indirect (economy-wide) agricultural policies for 18 developing countries for the 1960 to 1983 period. They found that:

- (a) Most of countries imposed high taxes on their agricultural sectors via indirect agricultural policies. The indirect effects which include both the effects of macroeconomic policies on the real exchange rate and the extent of protection for non-agricultural commodities were larger than the direct effects, such as export taxes on agriculture. Krueger, Schiff and Valdes (1991) suggested that the indirect effects were two and a half times as large as the direct effects.

- (b) Most of the direct measures were contrary to the country's long term comparative advantage. For example, competitive (export) crops were taxed in many LDC, while uncompetitive food crops were protected. This suggests that agricultural policies in LDCs discriminate against export crops as compared to food crops.
- (c) Resources provided to agriculture, through measures such as subsidised credit, infrastructure, research and extension, were not equal to resources extracted.

It is clear that price intervention has hurt agricultural producers. Krueger, Schiff and Valdes (1991) further found evidence supporting the view that the countries discriminated heavily against agriculture by maintaining overvalued exchange rates, industrial protection and export taxation which are usually associated with low agricultural growth.

Timmer (1994) conducted a study specifically linking macroeconomic variables to the agricultural share of GDP in seven Asia-Pacific countries, including Indonesia. Using time-series data from 1960 to 1980, he found that changes in the foreign exchange rate, oil prices and rural-urban terms of trade affected the process of structural change significantly.

2.6 Agriculture in Theories of Economic Development

2.6.1 The Neglect of Agriculture

The most surprising aspect of development economic theories as espoused during the early years of development studies following World War II was the neglect of agriculture. Yet in this period the agricultural sector had a dominant position in almost all LDCs. This bias has often led to stagnant agriculture that, in turn, resulted in large shortfalls in domestic food production, balance of payment crisis, and political instability in a developing country.

Several factors lie behind the neglect of the agricultural sector. First, most policy makers and development economists came from the urban elite and they were remote from any real understanding of what makes the agricultural sector quite different from either manufacturing or services (Little 1982). Second, the development models of the time emphasised capital accumulation and the latter was seen as synonymous with industrialisation. Third, there was an enduring perception that the agricultural sector provided a source of surplus labour which could be costlessly transferred to the urban industrial sector (Lewis 1954). Finally, peasant farmers were often regarded in the development process as tradition-bound and unresponsive to market incentives.

The two-sector model developed in Lewis (1954) and in a number of subsequent growth models (e.g. Jorgenson 1961, Fei and Ranis 1964, Jorgenson 1967) argued that the agricultural sector provides the non-agricultural sector with an unlimited labour supply, at a wage rate equal to the subsistence level, or perhaps slightly higher in order to reflect the expense of moving from rural areas to the towns and the higher urban living costs. When the labour surplus has been eliminated, a low-productivity agrarian economy is transformed into the modern age of world economy.

The basic message conveyed by the two-sector models is that the pace of transformation is constrained mainly by the demand for labour in the non-agricultural sector. In turn, labour demand in the modern sector depends solely on the rate of capital accumulation in that sector, so that an increase in the capital stock becomes the main source of growth (Johnston and Mellor 1961). The capital stock is determined by the previous period's capital stock plus net investment, which comes from the capitalists' reinvestment of their profits.

The treatment of the agricultural sector in the two-sector models implies that agricultural growth is not affected by the process of industrialisation. The labour can be transferred from rural to urban occupations without a rural loss of food output. Because rural productivity is so low, an agricultural worker leaving the countryside would have little or no impact on food production in the village left behind. The village would produce the same amount of food but consume less. With the income earned in the factory this worker could now purchase the surplus food which had been left behind. In sum, in the dual economy models, agriculture plays an essentially passive role in the industrialisation process, while industry is the dynamic sector. In the dual-economy models, the theorists neglect the potential of agriculture in industrialisation, and simply see the industrial sector as having more potential and thus deserving more attention.

The theory of balanced growth across sectors in the economy was advocated by several economists in the 1950s and 1960s (e.g. Nurkse 1953, Rosenstein-Rodan 1951). This theory and the theory of unbalanced growth (Hirschman 1958) both appear to advocate a strategy of developing industry rather than agriculture.

The balanced growth theory, sometimes called a big push on all sectors at once, aimed to capture supply and demand externalities appropriate to large industrial economies of scale. This strategy tended to reject primary production in favour of industrialisation, the provision of goods for which the income elasticity of demand was relatively high. Nurkse (1953) recommended that in order to accelerate economic growth, the output of manufactured goods in developing countries should be organised (with planned

development) in accordance with domestic income elasticities of demand so as to provide markets for each other locally.

The balanced growth came to be associated with inward-looking development strategies, protectionist policies such as overvalued exchange rates, import restrictions, and explicit export taxes, which stimulate substitution of domestically produced goods for imports. This import-substitution strategy which was popularised by Prebisch (1950) was driven by the view that primary-commodity prices, including agricultural commodities, would inevitably trend downward relative to prices of industrial goods. Logic dictated that developing countries should shift resources out of agriculture into industry. However, history has generally shown the import-substituting industrialisation to be counterproductive and central planning of investment which was suggested by Nurske had fallen out of favour by the early 1970s. History has also shown that investment opportunities at any point in time in a particular country are usually unequal across sectors.

Those such as Hirschman (1958) who argued for the unbalanced growth strategy also implied the need for an industrial emphasis. Hirschman argued that, given scarce capital resources, investment should occur only in those key sectors exhibiting strong backward and forward linkages in the production process. Expansion of the key sector would create both new opportunities and bottlenecks elsewhere in the economy which would stimulate a secondary wave of investment and entrepreneurship. It may be noted that Hirschman (1958) also found that agriculture has very low linkages. On this basis, he recommended that highest priority should be given to public investment in the industrial sector. This extreme position showed a comprehensive lack of understanding of the key role played by agro-industries and of the way the agricultural output growth has depended on inputs from the industrial sector (Colman and Nixon 1994).

2.6.2 The Role of Agriculture in Economic Development

Attitudes towards agriculture's role in economic development have been transformed since the early 1960s. Rostow (1960), a noted American historian and economist, proposed a five-stage growth model: traditional society, preconditions for take off, take off, drive to maturity and the age of high mass consumption. He included agricultural productivity increases as one of the preconditions for take off.

Kalecki (1960) underlined the crucial role of technological change in agriculture, which has the dual effect of reducing the pressure on wages and creating demand for goods produced

in the non-agricultural sector. Food has often been called a wage good because wage labour spends such a high proportion of its income on it. Because of this status, lowering the price of wage goods has positive impacts on national income. An important outcome of technological change and increased productivity of agriculture in a developing economy is lower consumer prices for food. Because the poor spend a larger percentage of their budget on food, the rise in national income is more pronounced and more widespread. In addition to the direct income effect, the decline in wage good (food) prices has a multiplier effect on production. Urban employers do not have to raise wages as high as they would have to do in the absence of lower prices for food. The result is the employment of additional resources and the generation of additional output.

Kalecki (1960) considered that the basic prerequisite for a rapid industrialisation of a developing economy and in particular for the solution of the problem of unemployment and underemployment is a revolutionary upsurge in agricultural production. He also stressed that the prerequisite of the rapid development of agriculture is the overcoming of the institutional obstacles created by government policies. A skewed distribution of land holdings and insecurity of tenure for the cultivators can hamper the development of agriculture, the informal financial market represented by private money lenders supposedly having the effect of impoverishing their clients rather than assisting small farmers to improve their productivity. It was argued by Kalecki (1960) that the tenancy reforms and credit provision are considered key instruments to a successful agricultural development strategy. Improved irrigation systems, roads and market infrastructure also become critical as development proceeds.

Johnston and Mellor (1961) studied agriculture's role in economic development. They raised awareness among development economists of the interdependence between agricultural and industrial development by identifying five contributions of agriculture to economic development. First, agriculture provides food and raw material inputs for other sectors. If the increased demand for food is met domestically, this steady rise in food supply keeps inflation and wage costs down, thereby benefiting the economy greatly from such checks on inflationary tendencies and growth-retarding pressures. Furthermore, providing food needs from domestic sources would result in saving scarce foreign exchange for other needs. In addition, many industrial sectors depend upon agriculture for supply of raw materials (e.g. fibres for the textile industry). The benefit for raw material domestically produced for the economy is clear: the country saves on foreign exchange.

Second, as well as saving scarce foreign exchange, the agricultural sector can make useful contributions to foreign exchange either by raising a country's earnings from exports or by producing agricultural import substitutes. Exports of agricultural products can also help to

provide foreign exchange to pay for the import of capital goods and technology to modernise and expand the non-agricultural sectors of the economy. Through this contribution, agricultural development can facilitate the structural transformation of the economy.

Third, because of its size, the agricultural sector is an important potential source of demand for other sectors' output. A growing agricultural sector will stimulate the demand for industrial products. In this case, the agricultural sector provides the potential for rural consumption demand to create a mass market for domestically produced industrial goods and for inputs such as fertilisers, chemicals and agricultural implements.

Fourth, the transfer of surplus labour from agriculture to industry can provide a source of economic growth. In a rapidly growing economy there will be large and continuous transfers of labour from agriculture to urban areas. This is the relationship highlighted in the Lewis model, but this model ignores the necessity for labour release to be combined with, or preceded by, increased agricultural productivity if the marginal product of labour is above zero and average consumption of domestic food is not to fall.

Fifth, agriculture provides a net outflow of capital for investment in other sectors. For countries that want to industrialise, agriculture is commonly the main source of resources that can be captured for investment in the emerging activities. Hence, successful industrialisation requires a solution to the problems associated with the generation, transfer and use of an agricultural surplus. A net outflow of capital for investment can be extracted from agriculture through a variety of visible and invisible transfer mechanisms (Winters et al. 1998). Visible transfers include taxes, direct investment in industry by people in agriculture, voluntary transfers from agricultural to non-agricultural households and the net transfer of the balance of current accounts of agriculture. Invisible transfers can occur through declines in agricultural prices relative to industrial commodities (deterioration of the terms of trade against agriculture).

Neglect of the agricultural sector in overall economic growth and development came to be increasingly challenged, starting with the pioneering work of Schultz (1964). Schultz insisted that peasant farmers in traditional agriculture are rational, efficient resource allocators and that they remain poor because in most poor countries there were only limited technical and economic opportunities to which they could respond. Consequently, few or no gains are to be had from reorganising traditional factors of production. He further argued that agricultural technologies generally are highly location-specific and cannot be readily transferred among countries. Schultz suggested that the process of agricultural development can be accelerated through provision of new high-payoff inputs

and technologies, particularly improved seeds, fertilisers, pesticides and irrigation systems. For this reason, the Schultz approach has been labelled the 'high-payoff input' model (Hayami and Ruttan 1985).

The emphasis of the Schultz approach is on technological change as the prime source of growth and on the price mechanism. The role of government is to promote technological change and is not to be involved in determining resource allocation; that can be left to farmers who will respond rationally to price signals. As a promoter of technological change, the government should invest in agricultural research stations, in the provision of agricultural extension services and rural education.

The high-payoff input theory has been widely supported by a large number of empirical results. The high-payoff input model clearly has had a substantial impact on agricultural development strategies in many developing and developed countries.

The high-payoff input theory, however, treats technical change as an exogenous, 'mana from heaven' factor superimposed from the outside through the activities of scientist and technologists. The model is incomplete because it fails to explain how technical changes are induced in a country. Hayami and Ruttan (1985) argued that the theory also fails to explain how economic conditions induce the development of public agricultural experiment stations and educational systems. The theory does not attempt to specify the process by which farmers organise collective action to develop public infrastructure such as irrigation and drainage systems. Hayami and Ruttan (1985) further argued that the high-payoff model of agricultural and economic development remains incomplete unless the mechanism is specified by which collective action, by people in the society, is organised to facilitate the supply of public goods, including new technical knowledge, and institutions in response to changes in economic conditions.

The Hayami-Ruttan model of induced innovation in agriculture (Hayami and Ruttan 1985) incorporates all the elements of the high-pay-off input model but treats technical changes as endogenous to the sector. The theory of induced innovation helps explain the mechanism by which a society chooses an optimal path of technical and institutional change vital to agricultural development.

The main proposition of the theory of induced innovation is that the qualitative characteristics of technical change and its biases are determined by market forces. More specifically, the theory suggests that innovations occur in the public as well as the private sector in response to price signals from the product and factor markets. In the absence of market failures and transaction costs (e.g. adjustment, information, negotiation costs)

changes in relative factor prices and technological innovations are guided by the pursuit to save on factors that are relatively more expensive. If labour is the limiting resource in the development process, then an efficient path of technical change must be labour-saving. If land is relatively limited and labour is in abundant supply, the innovations must save the scarce land. Chemical-biological innovations permit abundant labour to be substituted for scarce land. When either relative factor prices or product prices are distorted, the innovative behaviour of both public and private sectors will be biased.

According to the theory of induced innovation, technical change is induced by more than economic factors. In addition to the effects of resource endowments and growth in demand, technical change involves a much wider process of social change which has organisational and institutional aspects.

While the theory of induced innovation in agriculture does recognise the negative effect of inappropriate domestic macroeconomic policies towards agriculture (such as overvalued exchange rates), the effect of macroeconomic policies is not formally incorporated in the model.

During the 1980s, some development economists (e.g. Timmer, Falcon and Pearson 1983) emphasised that policies towards agriculture must move beyond microlevel and sector-specific concerns to ensure that the overall macroeconomic environment is conducive to the growth of the agricultural sector. The argument was that a development pattern that emphasised import substitution industrialisation and the macroeconomic policies that led to the overvaluation of the exchange rate and induced high taxes on the agricultural sector discriminated against the agricultural sector. As the literature documents (e.g. World Bank 1986), agricultural policies in developing countries are often highly distorted. When macroeconomic policies create distortions such as overvalued exchange rates, heavily subsidised interest rates and inflationary fiscal and monetary policies, agriculture is usually discriminated against and the economy in general is compromised. Therefore, pressures build for major macroeconomic policy reforms to help the agricultural sector by increasing farm incomes and rural employment.

2.6.3 Empirical Evidence

The diverging theoretical perceptions about the role of industry and agriculture in the literature of economic development can also be seen in practice with the development strategies adopted by developing countries since World War II. In practice, the industrialisation-led strategy encouraged highly capital-intensive activities while

discouraging intensive use of labour, the very resource most developing countries possess in relative abundance. Developing countries that pursued this strategy experienced slow growth in employment, faltering progress in poverty alleviation, failing domestic food supplies, rapidly increasing import needs and sharpening foreign shortages. The need for agriculture-led development strategy is, therefore, being stressed strongly in the recent development debates (World Bank 1982, Mellor 1986, Adelman 1984, Vollrath 1994).

A large and growing body of evidence strongly supports the notion that there is a fundamental symbiotic relationship between agricultural development and overall economic growth. The World Bank (1982) showed that among countries where the agricultural share of GDP was greater than 20 per cent in 1970, agricultural growth in the 1970s exceeded 3 per cent a year in 17 of the 23 countries whose GDP growth was above 5 per cent a year. During the same period, 11 of the 17 countries with GDP growth rates below 3 per cent displayed agricultural growth rates below 1 per cent.

Using cross-section data of the 1960s and 1970s for more than 60 developing and developed countries, Hwa (1989) showed that an increase of 1 per cent in the growth rate of agricultural output translates into an increase by 0.5 to 0.7 of 1 per cent in the growth rate of industrial output. In addition, Hwa's empirical analysis suggested that a significant linkage exists between agriculture and industrial development during the development process. He further demonstrated that agricultural growth contributes to overall economic growth through its favourable impact on total factor productivity. He also found that agricultural growth contributed more to economic growth than did export growth. Hwa's study reinforces the argument that an agriculture-led growth strategy may be superior to an industrial export-led growth strategy.

Bautista (1990) empirically examined agricultural growth linkages with the rest of the economy among 34 food-deficit developing countries. He estimated a growth-linkage elasticity of 1.3 for the period 1961-84 and 1.4 for 1973-84. This means that a 1 per cent growth in agricultural value added was associated with 1.3 and 1.4 per cent growth in value added in the non-agricultural sector during the period between 1961 and 1984 and the period between 1973 and 1984, respectively. He explained that the higher elasticity estimate in the period between 1973 and 1984 reflects the general improvement in rural infrastructure over time. In Bautista's study, it is also notable that in most Asian economies agricultural growth had a much stronger positive impact on non-agricultural income than did export growth.

Using data for 23 developing countries whose growth, contrary to the general trend, did not deteriorate during the 1970s, Singer (1984) observed that (1) agricultural growth was

significantly positively correlated with overall growth in the 1960s and the 1970s; (2) correlation was significantly higher during the 1970s than the 1960s; and (3) these correlations were distinctly stronger than the correlations between changes in export shares of GDP and economic growth. The latter result reinforces the argument that it is better to bring about agricultural growth rather than export growth as key factor. Hence, agricultural development should be given priority and be properly supported in an overall development strategy.

Singer's (1984) findings broadly support the importance attached by Adelman (1984) to what she calls ADLI (agricultural demand-led industrialisation) rather than a purely export-led growth strategy. By simulating a shift in the structure of investment in favour of the agricultural demand-led industrialisation, Adelman's results indicate that such a strategy would yield the same rate of industrialisation as does export-led growth but lead to a higher rate of labour absorption, a better distribution of income, better balance of payments, less poverty and a higher rate of growth in both rural and overall incomes than export-led growth.

2.6.4 Agricultural Demand-Led Industrialisation (ADLI)

In the 1990s significant changes have occurred in public policies, which have viewed agriculture more positively and advocated ADLI. A number of factors have contributed to this phenomenon. With the right policies, agricultural growth can reduce poverty (Mellor 1986). This happens because in LDCs agriculture is usually the largest sector containing most of the poor people and because the appropriate agricultural technology for most LDCs is labour-intensive. Thus, agriculture-led development will allow poor people to utilise their only asset, i.e. their labour power. It reduces poverty by generating rural employment and increasing the incomes of the poor. Agricultural growth reduces food prices, benefiting the poor who spend a large part of their income on food. By expanding productive employment in the countryside, rural-urban migration is thereby reduced (Todaro 1980). Reduced migration to towns can help the social and economic costs of excessive urbanisation.

Second, mounting food imports and foreign exchange constraints, which have squeezed essential imports available for meeting development needs of the economy, have increasingly turned attention towards the need to expand food production (Morris and Adelman 1988, Timmer 1988). Agricultural development is seen as an important source of foreign exchange saving and earning. Finally, the development aid agencies have been

emphasising the merits of an agriculture-based development strategy, with all the beneficial interlinkages it provides for overall development (Vollrath 1994).

Adelman (1984) recognised that agriculture can be the leading sector promoting growth and industrialisation. An ADLI strategy highlights the role of increased agricultural productivity via technological innovation and increased investment in raising rural incomes. Increased agricultural production creates a market for industrial goods because of strong demand linkages. As the demand for industrial goods increases, resource transfers from agriculture begin to occur. Growth in the non-agricultural sector follows. The other considerations of ADLI (Adelman, Bourniaux and Waelbroeck 1989) are:

- (a) investment in agriculture tends to be much less import-intensive and more labour-intensive than investment in the non-agricultural sectors;
- (b) the rate of return to investment in agriculture is equal to or higher than that to investment in industry;
- (c) rural expenditure patterns favour domestically produced goods over imports, goods with a high labour content over capital-intensive goods, and goods whose production relies on domestic inputs rather than imported inputs;
- (d) with the right policy mix, ADLI promises greater employment growth, equity and poverty alleviation.

Traditional studies of the role of agriculture in economic development focus primarily on supply linkages. The role of agriculture in providing effective demand for the products of other sectors (both as intermediates and for final consumption) has received little emphasis in the literature and has been poorly understood. The neglect of this aspect was reinforced by capital-centred growth theory, which tended to view consumption and the production of consumption goods as antithetical to growth (Mellor 1986).

On the supply side, the literature has distinguished two types of supply linkages between agriculture and industry: the 'Lewis linkages' and the 'Johnston-Mellor linkages'. The 'Lewis linkages' are based on the agricultural sector providing the non-agricultural sector with labour and capital (Lewis 1954). These linkages work primarily through factor markets. In the 'Johnston-Mellor linkages' the agricultural sector supplying raw materials to industry, food for industrial workers, markets for industrial output and the foreign exchange needed to import capital goods (Johnston and Mellor 1961). On the demand side, the literature has also distinguished two types of demand linkages between

agriculture and industry: the 'Mellor linkages' and the 'Hirschman linkages'. The 'Mellor linkages' arise from rural household final demands (Mellor 1986), while the 'Hirschman linkages' are induced by demand for intermediate inputs.

The received wisdom in the economic development literature, as mentioned earlier, has been that the agricultural sector has weak demand linkages with the rest of the economy. However, within the past two decades development economists have recognised that the demand linkages between agriculture and industry are quite strong, making agriculture a prime candidate for the role of leading sector in economic development (Mellor 1976, Hazell and Roell 1983, Adelman 1984, Mellor 1986, Haggblade, Hazell and Brown 1989, Vogel 1994). By ignoring the demand linkages, the importance of agriculture in economic development has consequently been seriously underestimated.

The implementation of an ADLI strategy requires policies in three different arenas. First, in order to maintain a strong growth rate in food production, the strategy emphasises the need for technological diffusion and massive infrastructural investments in agriculture that relieve some of the bottlenecks on the supply-side of the agricultural sector. Adelman (1984) argues that the essence of the ADLI strategy lies in shifting a greater share of total investment to the agricultural sector to improve agricultural productivity. This investment includes investments in agricultural research and extension service, in irrigation and in other rural infrastructure (such as marketing, transportation and communication networks, and education facilities) to hasten adoption of high-yielding varieties, the introduction of new crops, and the use of manufactured inputs, such as fertiliser and equipment to cultivate them.

She further argues that, within the agricultural sector, the emphasis of an ADLI strategy should be on improving the productivity of food production rather than export crops, and on small- to medium-scale farms rather than large farms, plantations and estates. The rationale for these choices is partly in terms of induced growth effects and partially in terms of distributional consequences.

Second, policy makers must carefully design trade policies that do not discriminate against the agricultural sectors. Opportunities for rapid productivity growth in agriculture exist provided the capital requirements for technological change and rural infrastructure development (among other needed investments) are met. But there is cause for scepticism whether agricultural resource transfers can help accelerate the development process unless policy-induced distortions (such as overvalued exchange rate, terms of trade between agriculture and industry in favour of the industrial sector and highly protected domestic

industries that supply manufactured agricultural inputs and the goods purchased by rural households) are removed.

Adelman and Vogel (1995) argue that successful implementation of the ADLI requires careful management of the agricultural terms of trade, so as to enable farmers' incomes to increase with improvements in agricultural productivity. The terms of trade between agriculture and industry in favour of the industrial sector choke off agricultural growth, rural incomes and rural demand linkages. These detrimental effects on agriculture destroy incentives to improve farmers' level of efficiency. Finally, successful implementation of ADLI presumes that land-tenure arrangements encourage a farmer's responsiveness to price incentives and the adoption of more productive technologies (Adelman and Vogel 1995).

2.7 Summary

At the macroeconomic level, the pattern of structural change associated with rising income has been broadly similar in most countries. But because individual countries have deviated significantly from the average pattern, it is important to consider Indonesia's starting point and circumstances. This aspect will be discussed in the next chapter.

It has been clearly demonstrated in this chapter that the relative decline in the economic importance of the agricultural sector is a normal, common and inherent feature of growth in all economies. The uncertainties in the external economic environment and domestic economic policies that discriminate against agriculture are more likely to accelerate a secular decline in the share of the agricultural sector.

In this chapter, we have discussed the theoretical and empirical presumptions which lie behind the neglect of agriculture in development policies. Theoretically, two significant forces which cause changes in the structure of an economy: (1) the income elasticity of demand, and (2) the rate of productivity of growth, are highlighted.

It has also been shown in the chapter that there is a large and growing body of evidence strongly supporting the notion that there is a fundamental symbiotic relationship between agricultural development and overall economic growth. The last section in this chapter has presented the general arguments for the adoption of an agricultural demand-led industrialisation (ADLI) strategy.

Chapter 3: The Indonesian Economy and Agricultural Sector

3.1 Introduction

This chapter describes the Indonesian economy in general and the external and domestic macroeconomic environments under which the agricultural sector functions. The main characteristics of the Indonesian economy are described in section 3.2. The performance of the economy, its characteristics, its development emphasis, the ensuing structural changes and the onset of the current financial crisis are highlighted in this section. Section 3.3 describes the performance of the agricultural sector, followed by an examination of the external and domestic macroeconomic environments which support or restrict agricultural development in Indonesia.

3.2 Overview of the Indonesian Economy

Indonesia is an archipelago situated between mainland Southeast Asia to the north and Australia to the south. The country consists of 13 667 islands of extremely varied size, of which some 1000 are inhabited. The total land surface of Indonesia covers more than 1.9 million square kilometres, surrounded and separated by approximately 6 million square kilometres of territorial waters. The main islands in terms of size and economic importance are Sumatra, Java, Bali, Kalimantan (about two-thirds of Borneo), Sulawesi and Irian Jaya.

Indonesia has a diversified resource base, with sizeable deposits of petroleum, natural gas and other minerals. Indonesia is the leading exporter of palm oil, a major exporter of tropical hardwoods and a major producer of rubber. With an estimated population of about 200 million in 1996, Indonesia is the fourth most populous country in the world, after the People's Republic of China, India and the USA. Despite a very effective family planning program, Indonesia's population increased at an average rate of 1.71 per cent per year over the period 1985-1992. The Indonesian population is predominantly rural, but there are also large and growing urban areas. The latest 1994 population census data showed that almost 70 per cent of the total population lived in rural areas in 1990. The latest population census data also showed that the process of urbanisation has been very rapid. During the 1980-1990 period, the urban population increased by 5.36 per cent per annum while the rural population increased by only 0.79 per cent per annum. For

comparison, the 1980 population census data indicated that almost 78 per cent of the total population lived in the rural areas in that year. During the ten-year period, the rural population then decreased by 8 per cent.

Following the declaration of her independence on August 17, 1945, the Dutch attempted to reimpose colonial rule by force and accepted Indonesia's independence only after four years of armed struggle. Following the cessation of hostilities with the Dutch in 1949, during the early years of independence, Indonesia experienced modest economic progress (Hill 1996). However, in the early 1960s the political and economic climate under President Soekarno continued to be unstable.

The period up to 1965 was characterised by continued economic decline and a regime which 'in terms of disruption of the economy and capital consumption was worse than most wars' (Higgins 1972). During the 1960s, Higgins (1968) characterised Indonesia as the 'chronic dropout' and 'the number one failure among the major underdeveloped countries'. The extent of economic collapse cannot be measured due to the poor quality of economic statistics, but by the mid-1960s, the economy was wracked by inflation which had accelerated to over 600 per cent, the agricultural sector could not produce sufficient food to feed the country, poverty was the lot of the majority of the population, a large external debt had accumulated, and foreign exchange reserves and domestic savings were both negative (Gelb et al. 1988). According to Woo, Glassburner and Nasution (1994), during 1959-1965 real GDP growth had averaged only 1.8 per cent a year, while population had grown 2.5 per cent a year. The country was literally bankrupt, unable to meet payments due to foreign debt (Arndt 1984). He further argued that in 1965 export earnings had fallen to a level where they were barely sufficient to finance half the country's minimum requirements, excluding debt service. Debt service obligations were US\$ 530 million, whereas export earnings were only US\$ 527 million (Woo, Glassburner and Nasution 1994).

Economic and political conditions continued to worsen and Soekarno was compelled to hand over executive power to General Soeharto in 11 March 1966. The shift of presidency brought a tremendous change in politics and the economy. The new regime had established a strong national government by placing stability (political order) as a foundation to accelerate Indonesia's economic development.

Under the Soeharto New Order government the economic decline was speedily reversed. The New Order's economic team, which consisted of professional economists within the neoclassical tradition, adopted a drastic stabilisation program to halt the deterioration in economic conditions. The first stabilisation program was revealed in September 1966,

after an initial agreement with the Western creditors on debt relief and new loans had been reached. Its main elements involved a restrictive monetary policy, controls over government spending, a devaluation of the rupiah and a liberalisation of imports. Shortly after the implementation of these measures, the Western creditors established an IGGI (Inter-Governmental Group on Indonesia) to organise foreign aid, either bilateral or multilateral.

The most remarkable aspect of the 1966 stabilisation program was that a real economic expansion rather than a contraction of GDP accompanied the drop in inflation. Real GDP increased by about two per cent in 1967 (the first year of the program), and rapid rehabilitation brought 11 per cent growth in GDP in the following year. The rate of inflation was less than five per cent by 1971. Hill (1996) rightly labels the 1966 stabilisation program one of the most effective instances of inflation control in the twentieth century.

The New Order government marked a remarkably rapid transition from the economic collapse and hyperinflation of 1965-1966 to a period of stable and sustained growth with relatively low inflation rates. Over the past three decades of development process (1966-1996), real economic growth, mainly fueled by the oil industry with support from agricultural and manufacturing sectors, has averaged almost seven per cent per annum, comparable to other super-achievers of East Asia. Indonesia's impressive economic growth since the 1970s is exemplified by the increase in per capita income, from US\$190 in 1969 to US\$980 by 1995. With this level of per capita income in 1995, the World Bank classified Indonesia as a lower-middle-income country. This level of economic performance also made Indonesia one of the countries included in the World Bank's *East Asian Miracle* category (World Bank 1993).

As well as sustaining economic growth rates over the past three decades, the country's economic development has spread the benefits of growth widely over the population. Employment and foreign exchanges/savings were generated, real wages were increased, and the level of consumption was increased, resulting in significantly reduced poverty. Indonesia was able to combine accelerated economic growth with impressive progress in reducing poverty.

3.2.1 Growth and Structural Change

Hill (1996) divided the Indonesian economy since 1966 into four broad phases, each of which required significant adjustments of economic policy to allow the rapid expansion of

the economy to continue. These phases were (a) the period of rehabilitation and recovery, 1966-1970; (b) rapid growth, 1971-1981; (c) adjustment to lower oil prices, 1982-1986; and (d) liberalisation and recovery, 1987-1992. As illustrated in Table 3.1, the Indonesian economy has a consistently remarkable record of high economic growth in the past three decades, even in the periods of economic recession and readjustment. The GDP growth sustained a trend of more than 6.5 per cent per annum and virtually 5 per cent per capita per annum. These rates are well above the rate posted by the developed market economies (around 3 per cent) and significantly above the world average growth rate (around 2 per cent).

Table 3.1 presents the growth in GDP by sector in terms of each sector's contribution to the total growth which occurred. Table 3.1 indicates that Indonesia experienced a high rate of growth prior to the first oil boom in late 1973. In fact, growth over 1967-1973 was even higher than during 1973-1981 (the latter period, of course, covering the oil price shocks of 1973 and 1979). Over the period 1967-1973, agriculture, trade and mining were the most important sectors in terms of contribution to overall growth. During the period 1973-1981, trade and agriculture remained as major contributors, although manufacturing emerged as the most important sector for overall GDP growth. The share of public administration increased more than three-fold during the oil boom.

During the recession and readjustment phase, manufacturing and agriculture made the largest contribution to growth. The increasing share of agriculture reflects both slower GDP growths in aggregate and strong food crop performance in this period. A contracting mining share was clearly evident. Manufacture was again the largest contributor to growth in the final period. Trade was again the second largest contributor. During the export growth period, although the share of agriculture was declining, agriculture still had a significant impact on growth.

Until the mid-1980s the Indonesian economy was highly dependent on crude petroleum and natural gas exports. Together they generated nearly a quarter of GDP, more than 65 per cent of government revenue, and nearly three-quarters of total export revenue in the first half of 1980. The decline in oil and other primary commodity prices, which began in 1982, affected the Indonesian economy profoundly (Hill 1990, Booth 1992). The contribution of the collapse of petroleum prices, decline in the prices of Indonesia's traditional exports and the rise in the prices of manufactured and capital goods led to sharp deterioration in Indonesia's terms of trade. For example, the deterioration in terms of trade in 1986 was equivalent to 16 per cent of GDP (Woo, Glassburner and Nasution 1994).

Table 3.1: Sectoral contribution^{a/} to GDP growth rate in the Indonesian economy, 1960-1992 (percentage)

Sector	Recovery, 1967-1973	Oil boom, 1973-1981	Recession, 1982-1986	Export growth, 1987-1992
Agriculture	2.23	1.23	0.93	0.70
Mining	1.01	0.37	-0.20	0.50
Manufacturing	0.79	1.72	1.16	1.97
Utilities	0.05	0.08	0.10	0.08
Construction	0.58	0.66	0.08	0.63
Trade	2.01	1.29	0.50	1.23
Transportation	0.33	0.60	0.41	0.49
Finance	0.34	0.21	0.19	0.48
Housing	0.13	0.32	0.13	0.11
Public Administration	0.30	0.95	0.62	0.36
Other Services	0.13	0.08	0.09	0.19
GDP growth/annum (%)	7.90	7.51	4.01	6.73

Note:

a/ Sectoral contribution is estimated by multiplying the growth rate of each sector by its initial share in GDP.

Sources: Sundrum (1986,1988) and Hill (1996)

The most remarkable aspect of Indonesia's policy response to the deteriorating external environment is that it was undertaken voluntarily, promptly and in a balanced fashion (Thorbecke 1991). By devaluing the currency, slashing public spending, revamping the tax system, liberalising trade and financial sector markets, deregulating foreign investments, and improving the management of public investment, Indonesia had managed to restore economic growth and stimulate economic diversification. After a decade of structural adjustment, which did not require emergency stabilisation or structural adjustment loans from the IMF or World Bank, Indonesia's economy is far less reliant on petroleum and also far less reliant on agriculture as a source of incomes and employment.

The rapid growth of the Indonesian economy has been accompanied by significant structural changes. Sectoral shifts relating to the structure of production can be analysed in terms of GDP. It is clear from Figure 3.1 that agriculture's share of total GDP declined consistently between 1960 and 1993. The share of the agricultural sector in total GDP decreased from 54 per cent in 1960 to 18 per cent in 1993. The decline in agriculture's share appears to have followed the historical pattern of development enunciated in the Chenery-Syrquin model. The largest declines in agriculture's share were over the period from 1966 to the mid-1980s. The oil boom was probably responsible for the accelerated rate of decline.

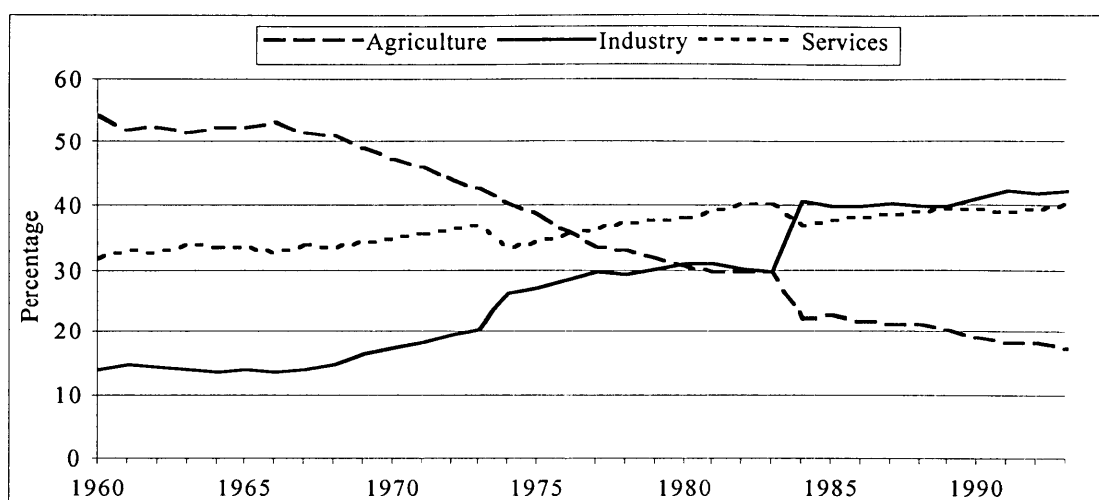


Figure 3.1: Structural change in Indonesian economy, 1960-1993

As for other oil-exporting countries, the impacts of oil production somewhat distorted the picture of structural change. This distortion biased downward the estimates for the contributions of agricultural sector and biased upward the rising share of industry, which is broadly defined to include mining, manufacturing, utilities and construction. Excluding the mining sector, the rate of decline in agriculture's share was slower (Figure 3.2). Between 1980 and 1985, for example, including the mining sector, agriculture's share fell from 31 per cent to 23 per cent, but agriculture's share excluding mining fell from 34 per cent to 28 per cent.

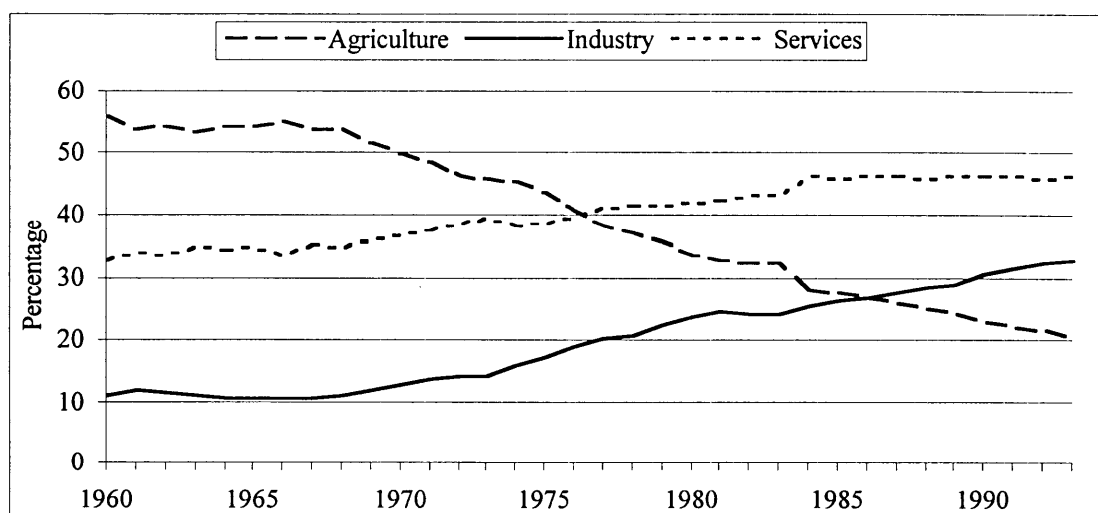


Figure 3.2: Structural change in Indonesian economy, excluding mining, 1960-1993

The received theory stipulates that in the development process the shares of industry and services increase. The experience of Indonesia for the period 1960-1993 corroborated this (see Figure 3.1). The oil price increases also greatly magnified the rising share of industry and services. The rise of industry's and services' share was then slower excluding the mining sector.

To seek empirical verification of Chenery-Syrquin's pattern of structural change in the Indonesian economy, the relationship between sector shares in output was estimated statistically. An ordinary least squares (OLS) regression was run against the log of income (GDP) per capita:

$$\ln XSH = a + b \ln YPC$$

where *XSH* stands for a share in GDP and *YPC* for per capita income. The findings reported in Table 3.2 are in conformity with the prevailing views on development patterns which predict that the centre of gravity in economic activities shifts from the primary to secondary sector and, further, to the tertiary sector as average per capita income rises. Judging from the t-statistics (shown in parentheses), the level of income per capita is statistically significant at five per cent level for all those sectors. The coefficient of determination adjusted for the degrees of freedom (adjusted R^2) for each equation indicates that about 64 to 96 per cent of variations in the sector share in GDP is explained by the regression equation.

Table 3.2: Regression results of structural change in the Indonesian economy, 1963-1990

	Constant	$\ln YPC$	Adjusted R^2
Agriculture's share (AGRSH)	4.20	-0.18 (-27.87)	0.96
Industry's share (INDSH)	2.48	0.20 (26.67)	0.96
Services' share (SERSH)	3.49	0.03 (7.56)	0.64

The structure of GDP reflects only one aspect of sectoral shift in the economy. Sectoral employment shares illustrate another important aspect of these changes. As Figure 3.3 shows, however, the dramatic structural changes implied by the structure of GDP are less

pronounced in the case of the sectoral distribution of the labour force. The figure shows that the percentage of employment in the agricultural sector decreased from 66 per cent in 1971 to 46 per cent in 1994. However, in spite of the gradual decline in the overall economy, the evidence above suggests the agricultural sector remains a major economic activity for employment generation and there is a need to promote labour-intensive non-agricultural employment in order to minimise unemployment problems in the near future.

The decrease in the contribution of the agricultural sector to employment is lower than that of production. This indicates the labour-intensive characteristic of this sector. Significant differences in the sectoral shares of output and employment imply also substantial differences in sectoral labour productivity. Hill (1996) showed that during 1971-1990, agricultural productivity was always far below the economy-wide average, while the industry and service sectors were above it.

As expected, the contributions of industry and service sectors to employment increased, but the increases in contribution to employment for both sectors were smaller than that to GDP. During the period 1971-1990, for example, the contribution of the industry sector to employment increased by only 7 per cent, while its contribution to GDP increased by 17 per cent. Similarly, during the same period, the share of services sector to employment increased by 9 per cent, while that to GDP increased by 10 per cent.

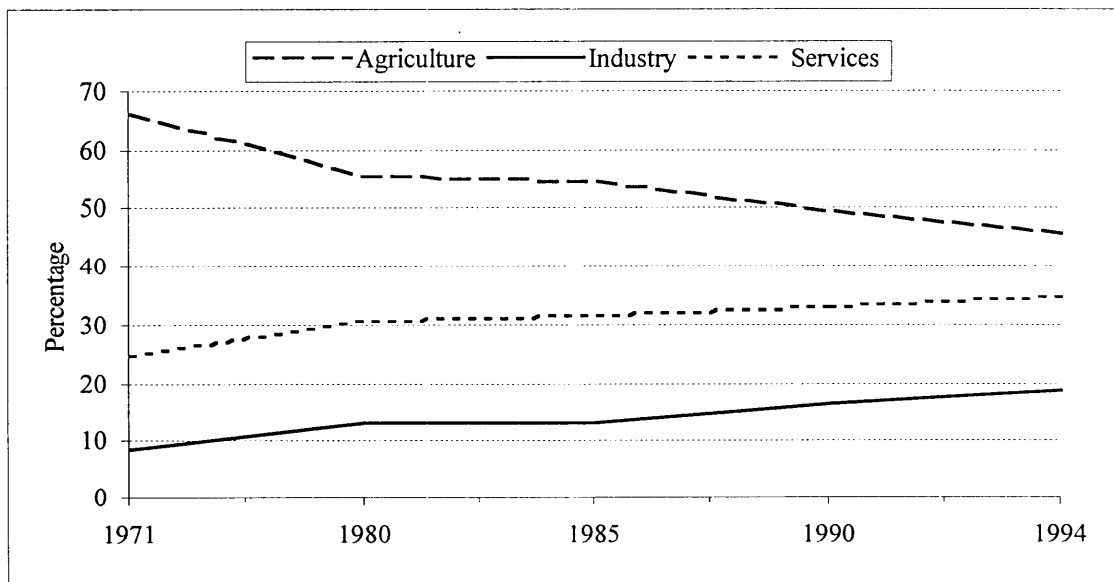


Figure 3.3: Structural change in Indonesian employment, 1971-1994

3.2.2 External Trade

Until the mid-1980s, crude petroleum and natural gas dominated Indonesia's export trade. At the peak of the oil boom years, 80 per cent of export earnings and 70 per cent of government revenues came from oil. This made Indonesia's export earnings highly dependent on the vagaries of the international oil market with serious implications for the government budget. For example, the slump in oil prices in 1986 resulted in a sharp decline in government revenue, deterioration in the terms of trade and a jump in the debt-service ratio. The contribution of oil and gas to government revenue fell from about 70 per cent in 1980 to about 40 per cent in 1986. The slump in oil prices in 1986 led to a 34 per cent deterioration in the terms of trade and a jump in the debt-service ratio from 26 per cent in 1985 to 37 per cent in 1986. In response, the government adopted a wide range of measures to raise the competitiveness of non-oil exports, and since 1986 the composition of Indonesia's export has changed significantly.

Since the mid-1980s, the reliance on primary exports has declined. The non-oil exports grew from about US\$5.9 billion in 1985 to about US\$30.4 billion in 1994 – a more than five-fold increase over a nine-year period. The annual growth rate of 20 per cent was more than four times faster than world export growth (Wardhana 1996). The ratio of non-oil exports to GDP rose from seven per cent in 1985 to about 20 per cent in 1994. The non-oil exports now play a much more important role.

The composition of non-oil exports also underwent a dramatic change. In 1985, primary products such as rubber, coffee, tea and tin, and aluminium, accounted for close to one-half of total non-oil exports. However, by 1994 their share had fallen to about one-quarter even though their absolute value had increased. Exports of garments, textiles, footwear and plywood were emerging as important export items. More recently, furniture, electronics and electrical products, and paper products have further diversified the export structure.

The value of Indonesia's merchandise exports has usually exceeded that of its merchandise imports. However, the country's balance on invisible account has traditionally been in deficit. This is partly due to the fact that Indonesia depends heavily on foreign purveyors of trade-related services, and partly because of heavy net outflows of factor payments, including interest on the country's overseas debt and repatriation of profits and income by foreign investors. The magnitude of the invisible deficit has normally exceeded that of the surplus on merchandise account, so that the current account has usually recorded

substantial deficits. The current account deficits have commonly been funded by large inflows on the capital account.

Until the early 1980s export growth usually outstripped import growth, producing a surplus in the trade account. However, data from input-output tables show that during 1985-1990 sectoral imports of goods and services grew at much faster rates than corresponding export growth. The total value of imports increased from Rp 16 234.0 billion in 1985 to Rp 53 100.7 billion in 1990, or grew at 26.7 per cent. Meanwhile, the total value of exports increased from Rp 22 522.5 billion in 1985 to Rp 53 288.6 billion in 1990, or at annual growth rates of 18.8 per cent during 1985-1990. The trend in the growth of imports and exports is adding to the current account deficits.

In 1990 the manufacturing sector was the largest importer. Its total imports amounted to 80.3 per cent of the total value of imports. Chemicals, machinery and other industrial goods, for example, constituted nearly 75 per cent. This is not surprising given Indonesia's industrialisation drive.

Indonesia's trade was traditionally biased toward Japan, the USA and Singapore, which together accounted for more than 75 per cent of Indonesia's exports and more than half of the imports. Of these countries, Japan was the most important trading partner of Indonesia. In 1993, 30 per cent of Indonesia's exports went to Japan while 22 per cent of imports came from Japan. In the same year, the USA accounted for 14 per cent of Indonesia's exports and 12 per cent of its imports. Singapore, the third most important trading partner, accounted for 10 per cent of Indonesia's exports and five per cent of its imports.

In its attempt to promote exports, Indonesia has to face protectionist forces in the export markets of the developed economies, especially for its commodities, and competition from the newly industrialising countries as well as from developing countries with cheap labour and cheap resources (like Malaysia, Thailand and the Philippines). Indonesia's competitiveness with Japan, the most important trading partner, measured in terms of real exchange rate, has been increasing since 1990, and the overall competitiveness against major industrial country trading partners has been maintained. However, there has been a slight decline in Indonesia's competitiveness with East Asia except Japan in recent years.

3.2.3 Poverty and Income Distribution

The acid test for economic development is not just the economic stability and growth numbers but, equally important, it is also whether human lives are improving and whether the fight against poverty is achieving success. The government of Indonesia holds that successful development involves the attainment of three goals: growth, equity and stability. As noted above, the economic reform has resulted in a high degree of economic stability and growth. It is therefore necessary to ask whether, and to what extent, the economic reform measures have contributed to greater equity.

As indicated by available data, Indonesia has reduced poverty incidence substantially. In 1970, poverty was widespread through the country. BPS (1995) suggested that almost 60 per cent of the population, nearly 70 million people, were living in absolute poverty in 1970. Since then, poverty has declined steadily and significantly, as shown in Table 3.3.

The incidence of rural poverty declined from over 40 per cent in rural areas in 1976 to just over 13 per cent in 1993, a reduction of almost 66 per cent (see Table 3.3). At the same time, the incidence of urban poverty declined by more than 56 per cent. There was also an absolute decline in the number of Indonesians in poverty from 70 million in 1970 to about 26 million in 1993. This decline reflected a substantial reduction in rural poverty.

The World Bank (1990) and Wolfensohn (1996) cited Indonesia as an example of a country where the rapid economic growth had a major impact on reducing poverty. The World Bank (1993) has shown that there is a systematic relationship between poverty incidence and economic growth in HPAEs (eight high-performing Asian economies, including Indonesia). Bautista (1992) attributed the reduction in poverty incidence to several elements in development strategy. (a) There has been rapid output growth accompanied by growth in productivity and wages which has led to more employment opportunities for the unemployed and low skilled labour, and increased overall per capita income. (b) There have been improvements in agricultural productivity resulting from the adoption of modern technology. (c) There have been governments which are more involved in providing welfare-enhancing public goods such as subsidised education, housing, sanitation and health care. (d) There has been success in slowing down population growth. With the level of income per capita at US\$980 (1995), however, Indonesia remains a poor country.

Table 3.3: Changes in poverty incidence, 1970-1993 (percentage)

Year	Urban	Rural	Total
1970	na	na	60.00 (70.0)
1976	38.79 (10.0)	40.37 (44.2)	40.08 (54.2)
1978	30.84 (8.3)	33.38 (38.9)	33.31 (47.2)
1980	29.04 (9.5)	28.42 (32.8)	28.56 (42.3)
1984	23.14 (9.3)	26.49 (31.3)	26.85 (40.6)
1987	20.14 (9.7)	16.44 (20.3)	17.42 (30.0)
1990	16.75 (9.4)	14.33 (17.8)	15.08 (27.2)
1993	13.45 (8.7)	13.79 (17.2)	13.67 (25.9)

Notes:

The parentheses contain number of poor people (millions)

na = not available.

The poverty line in Indonesia is defined as the level of expenditure associated with a daily consumption of 2100 calories.

Sources: World Bank (1992), BPS (1995)

Based on the available data, Indonesia has relatively low and declining levels of income inequality in both rural and urban areas (see Table 3.4). The declining level of income inequality in Indonesia is indicated by the trend in the Gini ratio, which fell slightly to 0.32 in 1990 from 0.38 in 1978. Krongkaew (1994) attributed the fall in inequality in Indonesia to the following factors: improvements in the real earnings for most workers in lower-income groups resulting from the strong pace and pattern of economic growth; the reduced burden of adjustment during the period 1983-1988 on the agricultural sector resulting from the exchange rate depreciation, agricultural pricing policies and some diversification from rice to profitable non-rice crops; and a surge in non-oil exports, and the maintenance of public investment in the rural sector.

Human resource development has also received strong emphasis in the development strategy. High economic growth rates experienced by Indonesia have been accompanied by significant improvements in the quality of life, as measured by such standard indicators as infant mortality, literacy rates and life expectancy. Over the period of 1960 to 1996, Indonesia managed to reduce infant mortality from 159 per 1000 live births to 60 per 1000 live births, increase adult literacy rate from 39 per cent to 84 per cent and increase life expectancy from 41 to 63 years. Improved access of the poor to the provision of social services such as basic education and health services has also been an important factor in the reduction of poverty and inequality.

Table 3.4: Changes in income inequality, 1970-1990 (Gini ratios)

Year	Urban	Rural	Total
1969/1970	0.33	0.34	0.35
1976	0.35	0.31	0.34
1978	0.38	0.34	0.38
1980	0.36	0.31	0.34
1981	0.33	0.29	0.33
1984	0.32	0.28	0.33
1987	0.32	0.26	0.32
1990	0.34	0.25	0.32

Source: Booth (1992), BPS (1995)

The positive association between economic growth and low inequality, which is found in Indonesia and other HPAEs countries, is not consistent with Kuznets' hypothesis (World Bank 1993). Kuznets (1955) predicted that the relationship between inequality and income per capita would be curved in an inverted-U shape with an initial phase of increasing inequality succeeded by a phase of decreasing inequality. The HPAEs' experiences have provided further evidence that the neglect of agricultural development enables economic development to proceed without any long-term stability. The experiences of the Philippines, for example, which had initially focused on industrial development to the neglect of agriculture, have resulted in higher rural poverty incidence and greater income inequality.

3.2.4 Government Policies

Indonesia's five-year development plans, known by the acronym Repelita (Rencana Pembangunan Lima Tahun), show the way in which policy imperatives were perceived at the time the plans were formulated. These plans apply to both the public and private sectors and set development priorities and specific sectoral growth targets which are subject to annual review. The plans are indicative in nature, however, and do not constitute detailed instructions for thoroughgoing state-controlled change with fixed sectoral targets (Hobohm 1995). In the case of the public sector, such details are contained in the government's annual budgets, while the private sector is permitted to formulate and implement its own plans within an overall framework.

The first three years of the New Order government were devoted to reform and rehabilitation essential to stabilising the economy and halting the economic deterioration that prevailed during the last decade of Soekarno's rule. After preconditions for reversing stagnation were completed during the stabilisation period 1966-1968, effective planning in Indonesia began with the introduction of Repelita I on 1 April 1969. Repelita I, which

covered the period 1969/1970-1973/1974, involved expenditure of US\$ 2 billion aimed at achieving an average annual growth rate of 4.7 per cent. Its main focus was on agricultural and infrastructural development, with some priority also being given to the establishment of a domestic manufacturing capacity for cement, fertiliser, and agricultural production and processing equipment. Repelita I can be regarded as largely successful as most of the targets were achieved or surpassed and the real annual GDP rate grew at 8.6 per cent.

Repelita II (1973/1974-1978/1979) reflected a moderate shift of emphasis in development thinking. Although still aiming for higher growth, Repelita II set specific priorities to reduce growing disparities between urban and rural areas. The emphasis of the plan was not only on improving agriculture, especially the production of rice and other food crops, public infrastructure and maintaining economic stability, but also on achieving a more equitable distribution of economic development. It also emphasised the role of both the private and public sectors in the establishment of an essentially mixed economy. The plan's targets, which included an annual average GDP growth rate of 7.5 per cent in real terms, were made easier to achieve by the substantial increase in budgetary and foreign exchange earnings accruing to Indonesia as a result of the rise in oil prices during the period. In fact, a real average GDP growth rate of 7.7 per cent per year was recorded during the plan period, with agricultural output growing by 4.6 per cent per year and manufacturing value added by some 13 per cent per year. Manufacturing started to be an engine of growth in this plan period. Unfortunately, much of the manufacturing growth was purchased at the price of protectionism and monopoly privileges.

Repelita III (1979/1980-1983/1984) was overshadowed by weakening international oil prices, as a result of which GDP was targeted to grow at an average rate of 6.5 per cent per year. It retained the main goals of the two previous plans with priority still given to agricultural development and distributional equity. The plan also envisaged an increase in the production of non-oil and non-gas traded goods, such as agricultural commodities, forestry products, non-petroleum minerals and, above all, labour-intensive manufactures.

Shortly before the introduction of Repelita III, Indonesia suffered major economic setbacks from a worsening external environment. The main source of external shocks was a severe deterioration in Indonesia's external terms of trade, primarily due to the collapse of the world oil price from 1982 on. In addition, the depreciation of the US dollar against other major currencies magnified the adverse external shocks. Since a large proportion of Indonesia's foreign debt was dominated by Japanese yen currency, which had appreciated against the US dollar, Indonesia's total debt service payments in dollar terms increased sharply.

The government reacted promptly to the deteriorating external environment by implementing a large variety of structural adjustment measures. The government adopted an austere budget for both current and investment expenditures after 1983/1984. The wage bill for civil servants was frozen and subsidies on petroleum product were reduced. Many large capital- and import-intensive public investment projects were rephased or cancelled. Tax reform programs, including a new value added tax, were introduced to offset the fall in petroleum-related revenues. In terms of exchange rate management, Indonesia resorted to two mega-devaluations of the rupiah by 34 per cent in November 1978 and by 28 per cent in March 1983. Finally, the monetary policies were designed to contain inflationary pressures, prevent capital flight, and improve efficiency in the use of financial resources. As a result, the macroeconomic imbalances were significantly reduced while economic growth remained positive. Despite a worsening external environment, real GDP over the Repelita III period averaged 5.7 per cent per year.

The introduction of Repelita IV, which was launched in April 1984, was accompanied by a vigorous debate about Indonesia's development strategy (Hobohm 1995). The Indonesian leadership realised the limitations of an import-substitution (IS) industrialisation strategy. The IS strategy failed due to the limited domestic market and concentration of benefit among the few foreign firms and local partners, adoption of capital-intensive technology, overvalued currency and inefficient forward and backward linkages. The launching of Repelita IV marked a clear re-orientation towards export-oriented manufacturing. This shift was considered a means of offsetting the anticipated slowdown in oil exports and of generating more employment opportunities for its large pool of labour.

The Indonesian government has successfully promoted its non-oil and non-gas exports by shifting from an import-substituting (IS) to an export-oriented (EO) industrialisation strategy. This switch started in 1986 through a wide range of structural adjustments and generous international financial assistance. A summary of the policy measures initiated toward the end of 1988 is presented in Table 3.5. Average real GDP growth rate of 5.2 per cent per year was achieved during the Repelita IV period, with the manufacturing sector as a whole growing at 12.9 per cent per year and its non-hydrocarbon component at 12.1 per cent per year. As a result of the adoption of an EO industrialisation strategy, the value of non-oil and non-gas exports in 1987 extended the combined value of oil and natural gas exports for the first time in more than a decade (Hobohm 1995).

By the time Repelita V was launched in April 1989, the Indonesian economy's dependence on the oil and gas industry had been significantly reduced and the trend towards privately funded industrial investment well established. Repelita V gave more

emphasis to the private sector, which was expected to contribute no less than 55 per cent to total investment. Repelita V aimed to achieve an average real annual GDP growth rate of 5 per cent. The manufacturing sector was expected to grow at an annual average rate of 8.5 per cent and the non-hydrocarbon component was expected to grow at an average rate of 10 per cent per year. Human resource and public infrastructure investment also received greater attention.

The plan's targets were exceeded. The actual growth rate of GDP was 6.6 per cent per year. The manufacturing sector grew at an average 10 per cent per year, with its non-hydrocarbon component growing at an average 11 per cent per year. As a result of these remarkable developments, agriculture's share in GDP was superseded by the manufacturing share in GDP for the first time in 1991.

Table 3.5: Adjustment policies initiated in Indonesia, 1983-1988

Policy instrument	Description
Exchange rate	<ul style="list-style-type: none"> – Rupiah devalued against US\$ by 28 % in March, 1983; since then exchange rate made more flexible. – Rupiah devalued by 31 % in September 1986. – Nominal exchange rate has depreciated against a falling US\$ since September 1986.
Fiscal policy	<ul style="list-style-type: none"> – Large capital- and import-intensive projects rephased in May 1983. – Major cutbacks in public real capital spending after 1983. – Restraints on civil service employment and salaries. – Major tax reform initiated in January 1984. – Follow-up steps taken to strengthen tax administration.
Monetary and financial policy	<ul style="list-style-type: none"> – Major financial reform in June 1983 removed interest rate and credit ceilings for state bank operations and introduced new instruments of monetary control. – New financial measures introduced in October and December 1988 to improve financial sector efficiency and develop capital markets. – Monetary management for controlling inflation improved. – Short-term monetary management for curbing exchange rate speculation improved.
Trade and other regulatory framework	<ul style="list-style-type: none"> – An across-the-board reduction in nominal tariff introduced in April 1985 and October 1986. – Measures to provide internationally priced inputs to exporters announced in May 1986. – Significant reduction in import licensing system, switch of non-tariff barrier to tariff barrier, and reduction on tariff announced on 25 October 1986, January and December 1987, and November 1988. – Regulatory restrictions for exporters reduced in December 1987 to limit the antiexport bias of trade policy. – Reorganisation of customs, shipping and ports operations announced in April 1985 to reduce freight costs and cut procedural time. – Deregulation of maritime activities announced on November 1988 to reduce costs and encourage private participation. – Steps taken in May 1986, October 1986, and January and December 1987 to reduce investment and capacity licensing requirements, relax foreign investment regulations, and reduce the role of local-content program.

Source: Ahmed (1991)

Repelita VI (1994/1995-1998/1999) and the Second Long-Term Development Plan (to the year 2020), which both commenced on 1 April 1994, have the same basic goals: continue to emphasise the importance of macroeconomic stability, rapid sustainable economic growth, and further poverty reduction. Their growth targets are essentially a continuation of past performance, based on further economic diversification and export-led growth, particularly of manufactures. Meeting these targets will require further deregulatory measures to improve resource-use efficiency, as well as making monetary and fiscal policies more responsive to stabilisation requirements.

The overall GDP growth target for the plan is 6.2 per cent per year (at 1983 prices), based on non-oil GDP growth of 6.9 per cent. The plan predicts that the manufacturing sector will grow at 9.4 per cent per year, and non-oil and non-gas manufacturing at 10.3 per cent. Agriculture is expected to grow at 3.4 per cent. The plan also predicts that maximum annual inflation will be 5.0 per cent, a maximum current account deficit 1.7 per cent of GDP, and average employment growth 2.9 per cent.

The economic performance of the first three years was well above target, with real GDP growth rates of 7.5, 8.2 and 7.8 per cent, respectively. However, despite the economy's strong performance during the first half of 1997, the rupiah began to weaken in the second week of July 1997, following the floating of the Thai baht. By the end of the year it had fallen precipitously. GDP growth for the whole of 1997 declined to 4.6 per cent owing to subdued increases in all components of aggregate demand (BPS 1998). Growth in the manufacturing sector slowed to 6 per cent on account of liquidity constraints. The GDP in 1998 is forecast to decline. The chairman of the Indonesian Central Bureau of Statistics (BPS) predicted that real GDP could fall by 10.1 per cent (*Suara Pembaruan*, 3 June 1998). Among all Asian countries, Indonesia has been the hardest hit by the crisis. Its currency has declined in value more than 70 per cent from Rp 2 450 to the US dollar in July 1997 to Rp 11 000 to the dollar in mid-September 1998 (at the time of writing). The prices of essential commodities have skyrocketed and the numbers of people below the poverty line are increasingly dramatically. The Minister of Manpower said that unemployment would reach 15.4 million by the end of 1998, representing 17.1 per cent of the labour force (*The Indonesian Observer*, 3 June 1998). Even private economists and the World Bank predicted that unemployment could hit 20 million, 21 per cent of the workforce, plunging some 50 million into poverty (*The Australian*, 20 July 1998). Much of this new unemployment is occurring in sectors that are highly indebted because they are tied to the dollar economy through loans or through dependence on imports.

The severe drought associated with the El Nino phenomenon has plagued Indonesia. This has only made matters worse. Another feature of the El Nino-related drought was the

devastating fires in East Kalimantan and Sumatra in late 1997 and early 1998. In addition to a severe blow to agricultural sector performance, the smoke from the fires has dampened tourism, which is a major foreign-exchange earner.

3.2.5 The Current Financial Crisis

Until mid-1997, the Indonesian government has made impressive progress in a number of socio-economic areas including continued macroeconomic stability, rapid sustainable economic growth, poverty alleviation, employment generation and ensuring adequate access to food by the poorest sector of the population. However, these remarkable trends have been reversed since the onset of the financial crisis in July 1997.

The foreign exchange and financial problems encountered by the Indonesian economy caught many by surprise, given that the economy was considered to be fundamentally sound and even held up as model for other LDCs to emulate. A huge fiscal deficit or high inflation was not apparent in the Indonesian economy. The current account deficit amounted to a manageable level of 2.9 per cent of GDP, and inflation was maintained at a single-digit level for more than two decades. In addition, Indonesia's reserve position remained strong, at a level of at least four months of its annual total import value. These developments suggested that Indonesia was poised to enjoy sustained economic growth.

The favourable outlook for the Indonesian economy attracted large inflows of foreign capital. By becoming more integrated in the world's economy Indonesia grows more vulnerable to uncertainties and fluctuations. The recent turbulence with the Indonesian rupiah is a good example of how uncertainty and distrust of domestic and foreign investors can have an impact on the Indonesian economy. In addition, given the greater degree of openness of the economy, political and social upheaval can easily trigger a capital outflow which can create a crisis in investments and later a slowing-down in the growth of the economy. The fall in the Indonesian exchange rate was due mainly to domestic capital flight, with international capital flight occurring later. The onset of financial crisis in this country appeared to stem from loss of confidence of some Indonesians in their own economy (Johnson 1998). Johnson also agreed with Soesastro and Basri (1998) who argued that political and social instability are often used to explain why the rupiah fell by more than other Asian currencies. In addition, the weak banking system and financial sector are vulnerable to an economic shock of this kind (Fisher 1998). The other factors which contributed to the crisis were excessive unhedged foreign borrowing in the domestic private sector and a lack of transparency in ties among government, banks and business. The uncertainty about the presidential succession, nepotism, cronyism and corruption in Indonesia were well tolerated by the international

community when economic growth and profits were strong, but became the focus of concern following the collapse of the Indonesian economy (Soesastro and Basri 1998).

The severity of the economic crisis, massive anti-Soeharto student protests demanding cheaper food and political reform, and devastating riots and destruction in Jakarta and some other major cities on 13-14 May 1998 led to President Soeharto's resignation after 32 years as head of state. President Soeharto stood down on 21 May 1998, handing power to Vice-President Habibie until the end of the presidential term in 2003, in accordance with Article 8 of the constitution. President Habibie's economics-related ministers are highly respected and the most capable economists in the Indonesian bureaucracy. President Habibie has promised to support the IMF policies and to implement reforms that would, among other aims, eliminate the rampant practice of corruption, cronyism and nepotism that characterised Soeharto's New Order regime. This is commonly abbreviated as "KKN" for "*korupsi, kolusi and nepotisme*".

Benjamin Fisher, the World Bank's country program coordinator for Indonesia, predicted that the current crisis may begin to show signs of recovery within two to three years (*The Financial Express*, 9 September 1998). This will depend on a number of factors, including the ability of the IMF reform packages to boost confidence for investors.

3.3 The Role of Agriculture in National Economy

The transformation from an agricultural to an industrial economy is clearly shown in Table 3.6, Figure 3.1 and Figure 3.2. Although its role is declining as in most LDCs, agriculture is still an important sector in the Indonesian economy. In 1994, almost one half of the Indonesian workforce was employed in the agricultural sector (BPS 1995). In terms of contribution to real GDP, agriculture still has a prominent position which manufacturing only recently overtook. Table 3.6 shows that between 1973 and 1993 the share of agriculture in GDP declined from 30 per cent to 17.59 per cent.

Agriculture's declining contribution and slower growth relative to the non-agriculture sector was not, however, the result of unusually poor performance. While total GDP expanded at an average annual rate of 6.17 per cent during the period of 1973-1993, the agricultural sector grew at an average rate of more than 3 per cent (Table 3.8). By international standards, Indonesian agriculture has performed well (Glassburner 1985, Booth 1988, World Bank 1992). Previously, the World Bank had shown Indonesian agricultural production growing at a faster rate than the average of both the lower- and upper-middle income categories of nations in the period 1970-1982.

Table 3.6: Changing importance of agriculture and its subsector to GDP in Indonesia, 1973-1993 (at 1983 constant prices)

	1973	1978	1983	1988	1993
Total Agriculture	30.00	24.71	24.01	21.22	17.59
Farm food crops ^{a/}	17.09	14.44	15.00	12.98	10.28
Farm nonfood crops ^{b/}	3.25	2.48	3.11	2.84	2.47
Estate crops ^{c/}	0.76	0.75	0.51	0.62	0.64
Livestock	2.98	2.14	2.38	2.21	2.01
Forestry	4.12	3.22	1.35	1.01	0.71
Fishery	1.78	1.69	1.66	1.56	1.47
Mining	30.00	28.12	18.95	15.90	13.86
Manufacturing	5.26	8.78	11.14	18.19	21.10
Others ^{d/}	34.74	38.39	45.89	44.70	47.44
GDP	100.00	100.00	100.00	100.00	100.00

Notes:

a/ Includes fruits and vegetables.

b/ Smallholder tree crops.

c/ Large estate tree crops.

d/ Includes utilities, construction, trade, transport and communications, and other services.

Source: Data from BPS (various issues)

The agricultural sector in Indonesia can be subdivided into six, namely, food crops (including fruits and vegetables), nonfood crops (smallholder tree crops), estate crops (large estate tree crops), livestock, forestry and fishery. Farm food crops, comprising rice and palawija (secondary) food crops, constitute the largest single component of agricultural GDP (Table 3.7). Between 1973 and 1993, the farm food crops subsector grew at an average annual rate of 3.50 per cent (Table 3.8). Consequently, the farm food crops share of agricultural GDP remained at around 60 per cent between 1973 and 1993.

Growth rates for the overall agricultural sector and the five subsectors are presented in Table 3.8. The rates are shown separately for each 5-year period, 10-year period and 20-year period between 1973 and 1993. Considerable variation is evident in the growth rates of the different subsectors. For example, the estate crops and livestock subsectors went from negative growth during the period of 1973-1987 and during the period of 1978-1983, respectively, to strongly positive rates in the next 5-year periods. The recent slowdown in agriculture is indicated by the lower 2.98 per cent annual growth rate during the period of 1988-1993 compared to 3.69 per cent during the period of 1983-1988.

Table 3.8 shows that the farm food value added in the period of 1973-1993 grew by 3.50 per cent. The growth of food value added exceeded population growth (2.1 per cent), thus

indicating an increase in per capita domestic food supply. During the period of 1973-1993 the growth of the food crops subsector was higher than overall sectoral growth. But, looking more closely, the growth rate of the farm food subsector slowed from 4.3 per cent in the period of 1973-1983 to 2.64 per cent in the period of 1983-1993, lower than overall sectoral growth in the same period. During the period of 1983-1993, all subsectors other than food crops and forestry grew at rates above the sector-wide average. The lower growth in food crops and forestry during the period of 1983-1993 pulled down the overall rate for the sector.

Table 3.7: Distribution of agricultural GDP by subsectors in Indonesia, 1973-1993 (at 1983 constant prices)

	1973	1978	1983	1988	1993
Total Agriculture	100.00	100.00	100.00	100.00	100.00
Farm food crops ^{a/}	56.98	58.41	62.48	61.16	58.43
Farm nonfood crops ^{b/}	10.84	17.17	12.97	13.36	14.07
Estate crops ^{c/}	2.54	3.04	2.12	2.94	3.64
Livestock	9.95	8.68	9.91	10.43	11.45
Forestry	13.74	13.01	5.62	4.78	4.06
Fishery	5.95	6.83	6.89	7.34	8.35

Notes:

^{a/} Includes fruits and vegetables.

^{b/} Smallholder tree crops.

^{c/} Large estate tree crops.

Source: Data from BPS (various issues)

Table 3.8: Growth rates of GDP by sectors, 1973-1993 (at 1983 constant prices)

	1973- 1978	1978- 1983	1983- 1988	1988- 1993	1973- 1983	1983- 1993	1973- 1993
Total Agriculture	2.59	4.24	3.69	2.98	3.41	3.34	3.37
Farm food crops ^{a/}	3.10	5.65	3.25	2.04	4.37	2.64	3.50
Farm nonfood crops ^{b/}	1.01	9.73	4.32	4.05	5.28	4.18	4.73
Estate crops ^{c/}	6.33	-3.02	10.67	7.49	1.54	9.07	5.24
Livestock	-0.18	7.05	4.75	4.93	3.37	4.84	4.10
Forestry ^{d/}	1.48	-11.88	0.38	-0.33	-5.44	0.02	-2.75
Fishery	5.46	4.43	5.00	5.68	4.94	5.34	5.14
GDP	6.64	4.84	6.29	6.92	5.74	6.60	6.17

Notes:

^{a/} Includes fruits and vegetables.

^{b/} Smallholder tree crops.

^{c/} Large estate tree crops.

^{d/} Export restrictions caused forestry value added to decline.

Source: Data from BPS (various issues). Growth rates calculated by the author.

The most significant development in Indonesian agriculture has been the successful transformation and modernisation of its farm crop subsector, largely under the impetus of the Green Revolution (that is, the introduction and diffusion of modern high-yielding varieties (HYV) of rice). In the past, expansion of the land area has been the main source of growth of agricultural output, but since the 1970s an increase in productivity has become the major source of growth, aided by the expansion of rural infrastructure and introduction of new technology (Booth 1988).

Until the early 1990s, Indonesia not only achieved self-sufficiency in rice but also generated a surplus which was loaned out to some countries in the region. During the production boom of rice, Indonesia also provided some rice aid to Africa. However, with the productivity gains levelling off in the early 1990s, a slow-down in the expansion of new areas and lower world oil and other primary commodity prices, it is unlikely that rice production will be able to satisfy the growing domestic demand over the next few years.

The share of combined farm nonfood and estate crops in agricultural GDP increased from 13.38 per cent in 1973 to 17.71 per cent in 1993 (Table 3.7). The increase was due to a substantial expansion in total areas of large- and small-scale state and privately owned plantations for palm oil, cocoa, tea and rubber combined with the introduction of high-yielding clones to producers primarily in Sumatra, Kalimantan, Sulawesi and Irian Jaya.

Plantation or tree crops are important commodities in Indonesian agriculture, providing foreign exchange for the country and raw materials for the manufacturing sector. In addition, tree crops are an important source of income for millions of smallholder families. It is estimated that more than seven million farm families were involved in the production of tree crops in 1994. The main tree crops cultivated in Indonesia are rubber, oil palm, coconut, tea, coffee and cocoa. The most significant increase has been in the production of copra. According to Akiyama and Nishio (1997), Indonesia's cocoa production increased at a compounded average rate of 26 per cent per annum between 1980 and 1994, from 10 284 tonnes to 271 127 tonnes, and surprisingly with few government interventions. Indonesia has now become the world third's largest cocoa producer, after Cote d'Ivoire and Ghana. The production of palm oil also increased dramatically at an average rate of 13 per cent per annum between 1975 and 1995. According to Larson (1996), production of crude palm oil in Indonesia has increased from less than 400 000 tonnes in 1975 to more than 4.4 million tonnes in 1995. Indonesia is now the world's second largest palm oil producer, after Malaysia.

The livestock share of agricultural GDP averaged around 10 per cent between 1973 and 1993 (Table 3.7) but livestock output grew in absolute terms (Table 3.8). This growth has

been fostered by government in response to rising domestic demand and aims at both import substitution in the domestic market and exports to nearby markets such as Singapore. As Indonesian incomes rise, inevitable changes in food consumption patterns will shift to higher-valued foods such as fish and livestock products (especially poultry) and fruits and vegetables. In consequence, poultry, as a traditional and lower-cost meat, has increased at a phenomenal rate in recent years (East Asia Analytical Unit 1994). It has been suggested that Indonesia's poultry production could expand even more into export markets if high domestic prices for soybean meal (about 40 per cent above import parity prices) were changed (Trewin and Tomich 1994, East Asia Analytical Unit 1994).

In order to maximise the degree of domestic value added in Indonesia's forestry exports, the export of raw logs was gradually reduced. These restrictions culminated in an outright ban on log exports in 1985, which was only lifted in June 1992 when it was replaced by a very high export tax. The export restriction caused the forestry share of agriculture GDP to decline from 13.74 per cent in 1973 to only 4.06 per cent in 1993 (Table 3.7). The fishery subsector, while contributing only 8.35 per cent, has been growing rapidly over the period of 1973-1993. The growth rate of the fishery subsector in the period of 1973-1993 and the period of 1983-1993 are 4.94 per cent per annum and 5.34 per cent per annum, respectively (Table 3.8).

Agriculture also plays an important role in reducing poverty in rural areas. As explained in subsection 3.2.3, the incidence of rural poverty declined from over 40 per cent in 1976 to just over 13 per cent in 1993. It is likely that poverty alleviation in rural areas was largely attributable to the green revolution in rice, which also reflects irrigation development, fertiliser use and favourable price incentives. This has led to increases in income for producers, spread widely over the large number of small rice farmers with irrigated land. The rapid growth in tree crops production, which is concentrated outside Java where poor soils limit food production, has also contributed greatly to poverty alleviation outside Java.

Growth of the agricultural sector has been accompanied by an expansion of agricultural exports and considerable import substitution. Agriculture has thus contributed importantly to foreign exchange earnings and savings.

Data on agricultural export and imports in Table 3.9 are presented by three-year averages in value terms to eliminate some of the year-to-year variations in volumes and prices. Table 3.9 shows that the external position of the agricultural sector is characterised by an increasing surplus in the trade balance over the period of 1974-1990, as exports have grown far more rapidly than imports. Over the period, the export of agricultural products

(excluding forestry products) expanded at an annual growth rate of 3.04 per cent, far higher than the 1.15 per cent annual growth rate of agricultural imports. The largest growth in agricultural exports occurred in processed agricultural products (11.31 per cent average annual growth) such as cocoa and chocolate, followed by fish and shellfish, mostly prawns (6.01 per cent) and fruits and vegetables (4.8 per cent).

Among agricultural exports, rubber is of greatest importance (27.72 per cent of total agricultural exports in 1988-1990), followed by fish and shellfish (21.26 per cent), coffee (12.64 per cent) and palm oil (12.62 per cent). The decrease in rice imports achieved through self-sufficiency has been offset to a degree by increased imports of wheat, soybeans, vegetable oils, livestock products and cotton. The rapid expansion of those imported commodities reflects a strong increase in domestic demand, for both human consumption and resource-based processing industry.

As the majority of the population is found in the rural sector, a large part of domestic consumption takes place there. Agricultural growth contributed to the growth of the domestic market for non-agricultural goods. The share of rural and urban incomes spent on nonfood commodities increased from 26.21 per cent in 1976 to 43.88 per cent in 1994 (BPS 1995). In 1994 more than 40 per cent of total rural and urban income growth was used to expand the market for industrial goods and services. Since agricultural incomes are lower and more evenly distributed than urban incomes, the increase in rural nonfood expenditures had a greater impact on the market for domestically manufactured goods than an equivalent increase in urban incomes would have done (Tabor 1992).

It should be pointed out that the high marginal propensity of agricultural households to consume domestically produced tradables has been of considerable importance in stimulating the increase of secondary and tertiary activities in the smaller cities and the rural areas (Budiono 1987). Thus, increased growth in the agricultural sector could provide a promising market for industrial output in the future.

Table 3.9: Agricultural balance of trade^{a/}, 1974-1990 (US\$ 000)

Commodity Group	1974-1976 Average	1979-1981 Average	1984-1986 Average	1988-1990 Average	Growth rate 1974-1990
EXPORT					
Tree and Beverage Crops	829 941	1 358 682	1 856 928	2 143 152	2.32
– Rubber	446 404	591 921	794 598	1 039 452	2.04
– Palm oil, other oils and products	160 803	127 590	253 776	473 217	3.01
– Coffee	168 676	540 206	650 401	474 015	2.43
– Tea	54 058	98 965	158 153	156 468	2.76
Food Crops and Feeds	60 202	95 031	107 612	115 102	1.44
– Rice ^{b/}		1 521	32 735	4 194	4.13
– Cassava, maize and feedstuffs	60 202	93 510	74 877	110 908	1.09
Processed Products	5 219	33 262	67 540	129 031	11.31
– Cocoa and chocolate	3 019	27 668	59 525	98 644	12.96
– Other processed foods	2 200	5 594	8 015	30 387	7.99
Fruits, Vegetables and Spices	69 013	130 034	218 937	384 855	4.78
– Fresh fruits and vegetables	22 591	58 904	70 037	199 269	5.97
– Pepper and spices	46 422	71 130	148 900	185 586	3.95
Animal and animal products	9 130	8 039	11 444	39 938	3.83
Fish and shellfish	103 762	141 415	263 503	796 859	6.01
Tobacco and products	37 733	56 947	53 304	99 325	2.05
Others ^{c/}	17 912	16 819	20 226	48 718	4.09
<i>Total Exports</i>	<i>1 123 782</i>	<i>1 844 483</i>	<i>2 612 475</i>	<i>3 748 632</i>	<i>3.04</i>
IMPORT					
Cereals	470 875	654 446	346 166	323 699	-1.01
– Rice	383 576	497 705	48 938	32 899	-3.88
– Wheat and flour	78 217	141 587	271 951	269 575	3.42
– Other cereals	9 082	15 154	25 277	21 225	2.24
Vegetable Oils	11 741	57 703	152 097	274 931	11.48
– Soybeans, other oil seeds	7 747	35 391	118 146	160 887	11.27
– Vegetable oils/products	3 994	22 312	33 951	114 044	11.57
Livestock Products and Feeds	36 239	139 511	190 645	283 667	5.70
– Milk and dairy products	32 015	76 513	63 544	75 333	1.68
– Animal and animal products	3566	20 127	21 145	30 400	5.69
– Animal feed stuffs	658	42 871	105 956	177 934	30.46
Fish and shellfish	4 699	3 431	4 683	5 117	0.36
Sugar	56 661	292 493	10 379	97 827	-0.98
Fruits and vegetables	12 659	75 271	27 190	55 540	2.55
Processed foods/beverages	60 734	107 014	40 662	39 539	-1.06
Tobacco	12 802	26 207	14 526	34 626	1.69
Cotton	72 608	167 906	188 656	387 962	4.21
Others	2 910	5 367	405	1 103	-2.64
<i>Total Imports</i>	<i>741 928</i>	<i>1 529 349</i>	<i>975 409</i>	<i>1 504 011</i>	<i>1.15</i>
NET BALANCE	381 854	315 134	1 637 066	2 244 621	6.27

Notes:

a/ Excludes forestry.

b/ 1979-1990 only.

c/ Adjusted figures to compensate for discrepancies in the published data.

Source: Data from BPS. Growth rates calculated by the World Bank (1992).

3.4 External and Domestic Macroeconomic Environments of Agriculture

The external and domestic environments have significant influences on structural change in Indonesia's economy and agricultural sector. The most important external events influencing the country's economic growth pattern are the two oil booms in 1972-1975 and 1979-1981, a drop in real oil prices in 1982-1986, and the decline in the world prices of agricultural commodity exports in the 1980s and 1990s. On the domestic front, through disciplined macroeconomic policy, pro-rural expenditure bias, well-designed smallholder development program and liberalisation of foreign trade and investment, the country achieved continuous and rapid economic growth in all sectors.

3.4.1 External Environment of Agriculture

(a) Escape from the 'Dutch Disease' Pressures

The theory of 'Dutch Disease' suggests that macroeconomic distortions resulting from petroleum exports will seriously constrain agricultural development in oil-exporting countries. An example of escape from the 'Dutch Disease' is found in the case of Indonesia (Pinto 1987, Scherr 1987, World Bank 1992, Auty 1995).

The Indonesian economy experienced three external shocks (in 1973, 1979 and 1986) which were each of a similar magnitude, at around 15 to 20 per cent of GDP per annum. The first two oil shocks were positive, whereas the 1986 shock was negative; the deterioration in the terms of trade was equivalent to an annual loss of 15 per cent of GDP. The 1986 shock was caused by the massive oil price fall. Although the shocks were similar in size to those experienced by Nigeria, at the same time, Nigerian per capita GDP declined sharply whereas Indonesia almost doubled its per capita income (Auty 1995).

During the two oil booms, the Indonesian government increased assistance to agriculture through investment in irrigation and agricultural research as well as giving subsidies for fertilisers and other farm inputs, so that the productive base of domestic agriculture was strengthened. This transformed the country's food deficit into self-sufficiency. The 'Dutch Disease' pressures were also contained by macroeconomic policies that reduced inflation: a public budget surplus in most years, an increase in public investment to offset a decline in private investment, low foreign borrowing, and use of oil revenues to repay petroleum company debts abroad. Repeated big devaluations in the exchange rate in 1978, 1983 and

1986 led to further depreciation of the exchange rate thereafter. Together with liberalisation in international trade and foreign direct investment, repeated mega devaluations were successful in supporting the development of agriculture and labour-intensive manufacture in which Indonesia's comparative advantage lay.

Unlike Indonesia, Nigeria's macroeconomic management and sectoral policies were largely prejudicial to agricultural development during the oil boom. A large share of the proceeds of the oil boom were expended on conspicuous and ambitious development with low rates of return (such as an integrated iron and steel industry) and government consumption. The excess effective demands resulted in inflation. The real exchange rate sharply appreciated under the fixed official exchange as the domestic price level increased faster than the international level. A substantial revaluation of the *naira* (Nigerian currency) and high inflation made exporting increasingly unprofitable, while food imports became increasingly competitive with local production. Higher incomes led urban Nigerians to change their eating habits in favour of imported foods. Consequently, agriculture was severely damaged. This process was aggravated by the fact that Nigeria directed its spending to the cities rather than the countryside. Investment in agriculture represented a very low share of the total government budget. Despite a smallholder-dominated economy, most agricultural investment was spent on subsidies of capital-intensive enclaves, or large-scale, capital-intensive infrastructure projects (Scherr 1985). The oil boom also led to a spending spree of unprecedented proportions as the government went into debt to finance infrastructure and construction of modern large-scale, capital-intensive industries, while private investors imported capital equipment, raw materials and consumer durables on credit. When the boom ended in 1981 and foreign credit dried up, the Nigerian economy was nearly bankrupt. There was insufficient foreign exchange to meet the country's food import needs.

This Nigerian experience was shared by many other oil exporting countries such as Algeria, Iran, Venezuela and Mexico (Gelb et al. 1988, Little et al. 1998, World Bank 1992). Table 3.10 provides a comparison of Indonesia's performance with four other OPEC countries (Nigeria, Algeria, Venezuela and Ecuador). Between 1974-1978 and 1979-1981, Indonesia's index of agricultural output showed a continued upward trend, increasing by 13 per cent per annum, while those of the other oil-exporting countries had declined. Its GDP growth rate remained steady around 5 to 7 per cent per annum, while the GDP growth rate of all other countries declined significantly. Its annual inflation rate was held at less than 8.5 per cent during 1980-1989, roughly a quarter the level recorded during 1975-1980. Oil-led development seems to be particularly detrimental to agriculture. However, we can learn from the Indonesian experience that a prudent, market-driven approach to macroeconomic management, the liberalisation of foreign trade and

investment, pro-rural expenditure bias, well-designed smallholder development programs to raise smallholder productivity and favourable pricing policies served not only to offset the 'Dutch Disease' pressures but to turn the internal terms of trade in favour of the smallholder agricultural sector.

Table 3.10: Comparative performance of Indonesia and other oil exporting countries

	Indonesia	Nigeria	Algeria	Venezuela	Ecuador
Population (million 1990)	181.6	117.5	25.1	19.7	10.6
<i>Per capita GNP (US\$)</i>					
1980	480	1 020	1 960	4 070	1 260
1989	500	249	2311	2471	987
<i>Oil windfall</i>					
1974 (US\$ billion)	4.2	7.9	3.4	5.6	0.8
As per cent of GDP	16.5	26.6	29.0	21.3	22.8
<i>Index of agricultural output</i>					
1974-1978	100	100	100	100	100
1979-1981	113	100	93	98	109
1982-1983	117	92	79	97	104
<i>GDP growth rate (% p.a.)</i>					
1965-1980	7.0	6.1	na	3.7	8.8
1980-1989	5.3	-0.4	3.3	1.0	1.9
<i>Average annual inflation rate (%)</i>					
1965-1980	35.5	14.7	10.5	10.4	10.9
1980-1989	8.3	14.2	5.2	16.0	34.4

Source: World Bank (1992)

(b) Agricultural Commodity Price Fluctuations

The Indonesian agricultural growth record of the 1980s and early 1990s was quite remarkable considering the adverse external environment in which agriculture had to operate. Commodity exporters were particularly unfortunate, confronting sharply falling commodity prices through most of the decade and up to 1993. The real commodity prices more than halved between 1980 and 1993 (World Bank 1994). These unfavourable movements in world markets for major traded commodities hindered agricultural performance for most commodity exporters. As can be seen from Figure 3.4, the price fall was evident for a wide range of commodities, with the notable exception of timber. More than three-quarters of the decline in the aggregate index is attributable to the price fall in agricultural commodities.

The price fall in agricultural commodities during this period can be attributed to two distinct factors: (a) a sharp increase in the aggregate supply of agricultural commodities on the world market mainly came from high-income countries, and (b) a sluggish demand in industrial countries.

The price trends of Indonesia's major agricultural primary commodities on the world market are shown in Figure 3.5. Since 1980, the real prices of cocoa, coffee, tea, palm oil and rubber fell by 6.27 per cent, 5.96 per cent, 1.39 per cent, 3.29 per cent and 3.72 per cent per annum, respectively.

As a group, developing economies which may be defined as primary commodity exporters grew more slowly during the past three decades than other developing economy groups (fuel exporters, manufactures exporters, services exporter, or diversified exporters) in each decade between 1960 and 1992 (World Bank 1994). But there are some examples to suggest that although world demand for most primary commodities tends to grow slowly, some primary commodity exporters can also be successful in maintaining high growth.

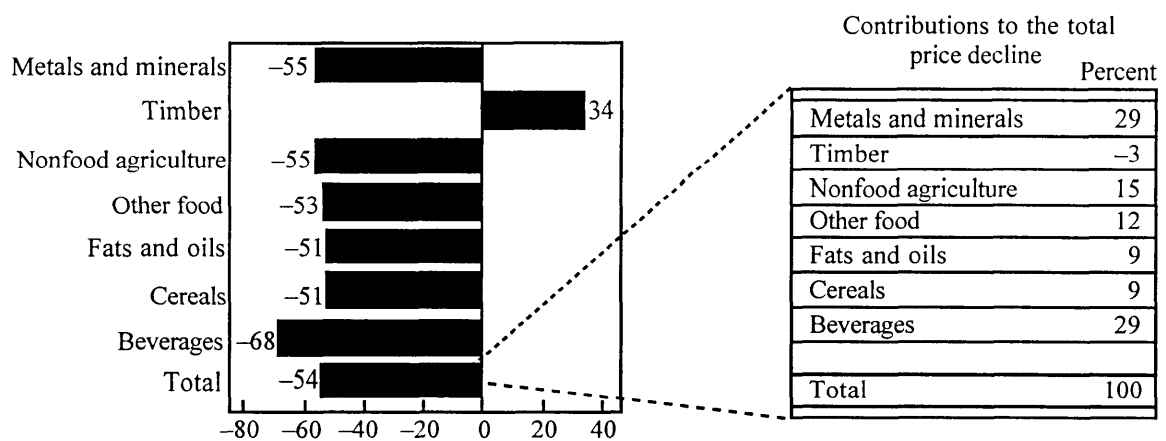


Figure 3.4: Changes in real non-oil commodity prices, 1980-1993 (per cent)

Source: World Bank (1994)

One example suggested by World Bank (1994) is Indonesia, which has been enormously successful in palm oil, shrimp, cocoa and timber products. Indonesia is one of many of today's successful developing countries (with Malaysia and Thailand) with a diversified export structure that was once heavily dependent on primary commodities. Indonesia, Malaysia and Thailand experienced periods of very rapid growth in commodity exports in their GDP, even during a period as adverse for primary commodity producers as the 1980s. According to Duncan (1994), the policies followed by all of those successful countries were much the same: maintaining stable macroeconomic environment using prudent fiscal policies, keeping the exchange rate in line with market forces, and ensuring a

hospitable environment for foreign investment and trade. While macroeconomic policy is certainly a key factor to improve the competitiveness of agricultural commodity exports, of equal importance are sectoral spending and direct pricing decisions. The Indonesian case clearly shows that the government pursued a program of smallholder agricultural development as a national priority, and pricing decisions were made in favour of agricultural products. These favourable environments can minimise distortions in the terms of trade between commodity producers and the rest of economy.

Evidence suggests that successful diversification away from primary commodities tends to be triggered by productivity increases in the primary commodity sectors (World Bank 1994, Duncan 1994). Three recent empirical studies have examined total factor productivity (TFP) growth rates for different sectors across a large number of industrial countries for the 1970s and 1980s (OECD 1985, Evans 1987, Bernard and Jones 1996). The three studies concluded that productivity growth had been more rapid in agriculture than in the rest of economy. Martin and Warr (1993) found that in Indonesia TFP growth in agriculture had been more rapid than in manufacturing, while a similar study on Thailand (Martin and Warr 1994) found no statistical difference between the estimates for TFP growth in agriculture and the rest of economy.

As has been discussed elsewhere in Chapter 2, the declining share of primary production in a growing economy is fully consistent with the finding that productivity growth in the primary sector is at least as high as in manufacturing, if not higher. The primary sector may have a high TFP growth and relatively low output growth as long as capital and labour are reallocated to other sectors rapidly enough (World Bank 1994, Anderson 1998). Martin and Warr (1993) found that the driving force behind Indonesia's declining agricultural share is the rapid rise in the capital-labour ratio which favours the relative growth of capital-intensive manufacturing. Thus, the capital deepening in the Indonesian economy stimulated nonagricultural employment and drew resources out of agriculture.

The relatively rapid pace of technological progress in commodities production explains why some commodity exporters such as Indonesia, Malaysia and Thailand have been able to experience a period of rapid and sustained growth despite the widely held view that commodity production is a brake on growth (World Bank 1994).

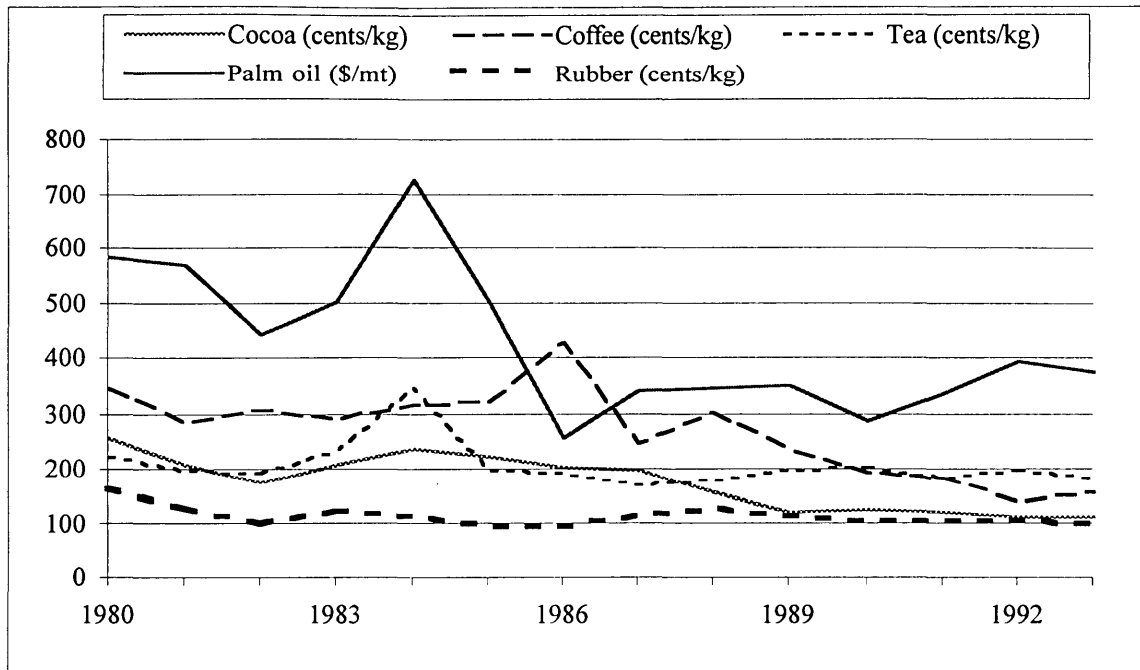


Figure 3.5: Changes in prices of Indonesia's major agricultural commodities on the world market, 1980-1993

3.4.2 Domestic Macroeconomic Environment of Agriculture

Among other things, natural endowment can influence the importance of domestic macroeconomic policy to agriculture through its effect on the government's fiscal status. During the 1970s and 1980s, the sudden surges in oil prices provided an important source of government revenue. Because of oil revenues, the Indonesian government could afford to support an output price policy, input (particularly fertiliser) subsidies, and heavy public investment in crop research, extension and irrigation, and did not have to rely heavily on agriculture as a source of revenue.

In contrast to other developing countries (including Taiwan, Thailand and Malaysia) which depended heavily on resources extracted from agriculture to support their early industrial growth, there is little evidence of major capital transfers out of agriculture in Indonesia. In fact, the sector has been a beneficiary of major inflows of public investment mobilised from oil export revenues and foreign aid. By using a Social Accounting Matrix (SAM) framework Morrisson and Thorbecke (1990) showed that in 1980 the domestic agricultural surplus in Indonesia was negative. This means that the non-agricultural sector provided a net excess of goods and factors to agriculture. This should not come as major surprise because the year 1980 corresponded with an early stage of the rice intensification

program, characterised by the adoption of HYV, large-scale use of fertilisers and pesticides in agriculture, and large government expenditure benefiting agriculture.

The agricultural sector, particularly the rice subsector, received significant support during the oil boom period. The high levels of investment in agriculture were supplemented by market stabilisation and support programs through the parastatal BULOG (Badan Urusan Logistik, National Logistic Agency). BULOG was established in 1967 by the government and tasked with ensuring an adequate supply of rice throughout the country at stable and affordable prices, including through imports when necessary. BULOG also provides monthly rations to the armed forces and civil servants and assistance in releasing food from stocks in cases of national catastrophes such as earthquakes and floods. BULOG's market interventions were later expanded to cover the import and distribution of a wide variety of commodities including sugar, wheat, wheat flour, soybeans and soymeal.

The direct support provided to the agricultural sector, as demonstrated by continuing positive nominal and effective protection rates for many important crops, places Indonesia among a small number of developing countries where agriculture has been given positive protection.

As can be seen from Table 3.11, Indonesia has employed a range of measures to protect the agricultural sector. However, in Indonesia agricultural sector growth is likely to have been constrained by relatively much higher rates of government assistance given to the manufacturing sector. High assistance to the manufacturing sector would have strengthened its relative position, and so 'artificially' enhanced its ability to compete for resources with the agricultural sector (Daryanto 1998a, 1998b). At the broadest sectoral level, effective protection (or assistance) afforded to manufacturing by measures such as tariffs and import licensing is estimated to exceed that provided to agriculture (including forestry and fishing) and mining (Table 3.11). Table 3.11 also confirms that during 1987-1990 on average there have been substantial reductions in protection for all tradable industries, more specifically for agriculture and manufacturing; and that the decline in the nominal rates of protection have been accompanied by a reduction in the anti-export bias of the trade regime. However, the decline in protection has been larger for manufacturing than agriculture. This means that there was a slight assistance bias in favour of agriculture over the period of widespread reform (1987-1990).

It appears that Indonesian export agriculture continues to be discriminated against by government policy, and import-competing agricultural subsectors continue to be assisted less than manufacturing. However, both biases are gradually becoming less as the reform continues. There are wide variations in protection within the agricultural sector for

different commodities. For example, the nominal and effective rates of protection for livestock products and some food crops (sugar, flour, soybeans) are among the highest.

Although the economic reforms since the mid-1980s reduced many tariffs and eliminated unnecessary non-tariff barriers, much remained to be done. In the agricultural sector, although the coverage of products subjected to non-tariff barriers (NTB) has fallen as can be seen in Table 3.12, the NTB coverage for this sector remains high compared with manufacturing.

Table 3.11: Nominal and effective rate of protection estimations by broad sectors in Indonesia, 1984-1994

	NRP ^{a/}		ERP ^{b/}	
	1987	1994	1987	1994
Import-competing (all)	22.3	11	47	22
Export-competing (all)	-1	-5	-2	-6
Agriculture	12	5	19	9
- Food crops	9	10	18	17
- Estate and smallholder crops	6	1	14	7
- Livestock	22	18	33	30
- Forestry	-17	-35	-20	-39
- Fishery	12	26	15	32
Mining and quarrying + oil	0	2	-1	1
Manufacturing	16	9	44	20
Manufacturing, excluding oil refining	21	12	80	19
All tradable, excluding oil, LNG and refining	16	7	31	14
All tradables	12	6	18	11
Anti-trade bias policy	41	31		

Notes:

a/ NRP expresses the absolute difference between the domestic price and the world price as a percentage of the world price.

b/ ERP is defined as the proportionate increase in its value added per unit due to the complete system of policies.

Source: Fane and Phillips (1991), Condon and Fane (1994)

Table 3.12: Percentage of output protected by non-tariff barriers by broad sectors in Indonesia, 1986-1995

Sectors	1986	1995
Agriculture	61	43
– Food crops	75	56
– Smallholder and estate crops	68	34
– Livestock	26	3
– Forestry	86	72
– Fishing	19	0
Mining and quarrying, including oil and gas	2	0
Manufacturing, excluding oil refining	80	24
Manufacturing, including oil refining	62	20
All tradables	52	23

Source: Stephenson and Pangestu (1996)

3.5 Summary

It has been demonstrated in this chapter that Indonesia's development record over the past three decades is impressive. Real per capita income growth has been positive every year and has averaged almost 5 per cent over the period. The transformation during this time of an economy heavily dependent on agriculture and natural resources to one that is now a major exporter of manufactured products has provided a diversified base of economic activity and employment. As well as sustaining economic growth rates over the past three decades, the country's economic development has spread the benefits of growth widely over the population. Indonesia was able to combine accelerated growth with impressive progress in reducing poverty.

There were at least four leading forces of economic expansion: import-substitution industrialisation, the green revolution, resource exploitation for international markets and direct foreign investment into all sectors of the economy. These forces were designed to internalise and shield the economy from the vagaries of the external world market.

An examination of the external and domestic macroeconomic environments which support or restrict agricultural development in Indonesia has also been carried out in this chapter. The most important external events influencing the country's economic growth pattern are the two oil booms in 1972-1975 and 1979-1981, drop in real oil prices in 1982-1986, and

the decline in the world prices of agricultural commodity exports in the 1980s and 1990s. On the domestic front, through disciplined macroeconomic policy, pro-rural expenditure bias, well-designed smallholder development programs, and liberalisation of foreign trade and investment, the country achieved continuous and rapid economic growth in all sectors.

It has also been noted in this chapter that the impressive progress in a number of socio-economic areas has been reversed since the onset of the financial crisis in July 1997.