Peasants and Policymakers, Agricultural transformation in Java under Suharto

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Hamburg, New Year's Eve 2007

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Glossary

Ani-ani	Small knife used in traditional rice harvesting
Balai Pertanian Lapangan (BPP)	Building used by the local extension system
Bank Rakyat Indonesia (BRI)	State bank which played a significant role in the modernisation process of rural Java
Badan Urusan Logistik (Bulog)	National rice procurement agency
Badan Pusat Statistik(BPS)	Central Bureau of statistics
Demplot	Demonstration fields
Dinas	State agency with particular assignments (agriculture in this study)
Ekbang	Economics and development officers in the village
Gotong Royong	A system for mutual aid
High Yielding Varieties (HYV)	Improved seed varieties that played a crucial role in the green revolution
Kantor Wilaya (Kanwil)	Administrative unit between the central regime and the provinces
Kecamatan	Administrative unit below Regency level
KUD (Kopeartiv Unit Desa)	Village co operatives
KUT (Kredit Usaha Tani)	Credit scheme for the farmers
The New Order	The Suharto regime was often called the new order to distinguish it from the Sukarno era. In this

	thesis it is use interchangeably with the Suharto regime
Palawija	Dry crops
Penyuluh Pertanian Lapangan(PPL)	Extension officers
Pupuk Srivijaya(Pusri)	State-owned fertiliser company
Repelita	Five-year development plans
Sawah	Irrigated field
VOC	Dutch East India Company

Chapter 1

Introduction

1.1 The research question

Indonesia, under Suharto, had come to be known as one of the Asian tigers. The average annual economic growth was well over five per cent in the 1970s and, except for a few years in the early 1980s, growth hovered between six and nine per cent until the crisis in 1997 (WDI 2006). Though some of this growth, particularly in the 1970s, was a result of growing oil revenues and OPEC held Indonesia as a role model for how oil money could be used to improve the economy, the track record for Indonesia was impressive (Hill, 2000:3, 11). At the end of the 1980s it was generally believed that Indonesia would soon join the select group of Newly Industrialised Countries (NIC). By the summer of 1997 that image was about to change as Southeast Asia was struck by an economic downturn. Indonesia was, according to many experts, a country with a bright future (World Bank 1997). As it turned out, it would be the country affected most deeply by the crisis. While other countries in the region recuperated, Indonesia also suffered outside the economic sphere, as the events developed into a full-scale political, social and territorial crisis (See Manning and Van Diermen 2000).

The causes of the financial crisis were soon established, but the severity and longevity of the overall economic situation cannot be explained by financial conundrums, mismanagement through incompetence and corruption, or the exploitation of a weak financial system. To understand why the Indonesian economy could go from experiencing relative success to floundering completely, the very structure of the economy has to be examined more closely.

Agriculture has been regarded a crucial part of the development process in Indonesia (see for example *Repelita* 1), which has sometimes been grouped together with the 'miracle' economies of the Northeast as following more or less the same development path. At the heart of the economic success in North East Asia was agricultural transformation as that sector served as the driving force in the initial stages of development (Oshima 1986). However, as highlighted by Booth, this is a highly questionable image of Indonesia's development path (Booth 2002). A closer look shows a far less egalitarian and dynamic picture of Javanese agriculture. Indonesia has made great advances, but through the green revolution and not agriculturally led growth.

Chapter 1

The aim of this thesis is to determine why the agricultural sector was not ready to stand on its own when the crisis hit. This will be done through a reconstruction of the agricultural transformation process in Java, focusing on the driving forces behind modernisation in Indonesian agriculture. Determining these forces will give an indication of the motives for change and a greater understanding of the agricultural question in Indonesia.

Although agriculture in Indonesia as a whole is very interesting, the focus here will be on Java since it is the most homogenous and populous region of Indonesia.

Historically, the image of Java has often been a pessimistic one. As far back as the 19th century several studies were carried out in Java by men closely connected to the Dutch civil service (Higgins 1984). The most notable one, Boeke, argued that the Javanese economy was divided into two sectors that could never meet. The future was in the modern sector while he saw little hope for the traditional agricultural sector (Boeke 1978). Like many of his peers he failed to see the role played by the colonial power in creating these conditions but rather blamed peasant society (Higgins 1956). In the 1950s a group of American researchers, one of whom was Clifford Geertz, took part in a major research project in Central Java. In a series of books, of which *Agricultural Involution* was to become the best known, a new view of agricultural development in Indonesia from the times of Raffles until the 1950s was presented. Two new concepts were introduced, *agricultural involution* and *shared poverty* (Geertz 1963). In Geertz's view, the effect of agricultural involution was that every labourer received an increasingly smaller portion of the harvest, and the income of the landholder or tenant decreased over time (Geertz 1963:77). The farming community ended up in what Geertz refers to as 'shared poverty'. Shared poverty was extremely important in his reasoning as it in the end led to the traditional sector being trapped in poverty with few prospects of breaking free as opportunities to increase income and productivity were limited (Geertz 1963). Although disagreeing with Boeke, Geertz's view of the causes i.e. the reasoning of the peasantry, seems to be very much the same. The people were bound by traditions and low technological levels. Not only did this lack of stratification of society entail poverty for the masses, but it also prevented the emergence of a small entrepreneurial class which could lead the way out of involution towards prosperity. He does recognise that local elites had existed at times, but these were not long lasting (Geertz 1963). Geertz concludes; agricultural development is a process which entails much suffering, be it in Europe or Japan. In Java, however, that suffering was in vain (Geertz 1963:143).

Although the theory was thoroughly refuted in the 1970s and 1980s, not least due to the great track record of Indonesian agricultural development under the Suharto regime (White 1983), there is some evidence that Javanese agriculture, despite the green revolution in the mid-1980s, reached a new equilibrium in terms of technology and organisation.[1]

This thesis will argue that, as in the 'miracle economies' of East Asia, agriculture did play a significant role in the development process. Nonetheless, the modernisation process in Indonesia was not pursued to the same extent as in the Northeast Asian states. While productivity in agriculture was important, the Suharto regime failed to address income and equity issues with equal fervour. Thus the answer to why growth in Indonesia was not agriculture-led cannot be found in the works of Boeke and Geertz but rather in Indonesia's inability to follow the model so successfully pursued by the Northeast Asian countries. The economy developed rapidly but primarily through subsidies and no internal dynamics were formed. The agricultural sector, which had been the driving force in the miracle economies, could not stand on its own legs in Indonesia. This in turn would also explain why agriculture was severely affected by the crisis in 1997.

1.2 The problem defined

1.2.1The agricultural perspective

As a result of the crisis, Indonesia has been the subject of many studies. The research has centred on macroeconomic issues with reports on currency fluctuations and restructuring of the banking sector etc. (see for example Wade 2002).When there has been an attempt to look at the people of Indonesia, the main focus has been on the urban population (See for example Ananta et al. 2004). Focus has thus been on the modern sectors of the economy, largely forgetting that when the crisis hit in 1997, over 60 percent of the population were still living in rural areas and at least 40 percent were employed within the agrarian sector (WDI 1999). Following the model of sustained high growth and relatively equal distribution implemented across Asia, and especially in East Asia, Indonesia carried out extensive agricultural intensification programmes under the green revolution.

[1] The concept of involution has been used in, for example, monsoon China. The theory has been stripped of cultural explanations and focuses on technological inferiority alone which causes a High Level Equilibrium (Elvin 1973)

Most often the countries of Northeast Asia have been seen as perfect examples of export-oriented economies. The engine of growth is said to have been the export industries and thereby the international rather than the domestic market as the initial, main contributor to growth. While exports, no doubt, had a significant impact on the development in these miracle countries, this was not always the case. On the contrary, these countries in the initial phase of development were committed to what Adelman calls an agricultural demand-led industrialisation (Adelman 1984). The idea of this approach to development was to increase investments in agriculture and thereby increase not only output but also productivity. The consequence of this strategy is then that it induces linkage effects between the industrial and agricultural sectors as a domestic market is created. Singer has argued that with a prosperous agricultural sector there will be a new demand for industrial inputs such as fertilisers, pesticides and agricultural tools, something which is confirmed by Adelman and many others in the East Asian case (Adelman 1984). Thus, in the 'East Asian Model', agricultural growth and a strong domestic market were central. Given the importance accorded to agriculture, not only as an employer but also in development policies across the region, the Indonesian model has to be assessed in terms of the strength of its agricultural sector, and we must therefore analyse the development patterns of the agricultural sector.

1.2.2 The need for an historical context

While this thesis uses the financial crisis in the late 1990s as a stepping stone, the crisis itself is of minor importance here. Rather, the crisis and its consequences are seen as symptoms of ongoing processes and events that took place much earlier, perhaps even at the onset of the New Order regime. Thus, in order to get to the core of the problem, the crisis, especially its far reaching consequences, cannot be seen as an isolated event but needs to be placed in an historical context. In an economic historical study it is possible to capture the long trends and the structural strengths and weaknesses of the economy.

Economic history is not a new discipline to Indonesia as it was one of the few areas where economists could freely roam without too much attention from the Suharto regime. Most of these studies, in any case, were focused on the time before Suharto came to power. A number of them, carried out in the 1980s and early 1990s (See for example Booth 1988; Eng 1996), covered the first part of the Indonesian modernisation project but did not include the aftermath of the green revolution. In addition, they were done on a macro level, and did not give more than a general view of the Suharto regime. In the late 1980s there were a

number of case studies on agricultural development conducted in several parts of Java (see for example Cederroth 1995). Even if these are more in-depth and stretch a few years further, and thus give a better understanding of particular areas of Java, they miss out on the ten years leading up to the crisis. The fieldwork for these was often conducted at, or near, the apex of the agricultural policy when Indonesia achieved self-sufficiency in rice. Indonesia was then seen to have taken that crucial step towards modernisation (Cederroth 1995). Although this is true, subsequent research on agricultural development in Java has been scant and, as a result, there is a need to revisit the topic of agricultural modernisation as it is important to determine if the positive trend seen in the first half of the Suharto era continued until the end of the regime.

In addition to previous research on the New Order, there are numerous studies which are often little more than scholars returning to the field after a number of decades, comparing the situation in the villages (See for example Keyfitz 1985). In doing so they can confirm or refute their speculations about the future made decades earlier. While providing a good overview of the changes that have occurred, they give few answers as to why and how they came about. Furthermore, agricultural development in Java, no doubt, immense in the Suharto period. Any problems in the development model will thus be overshadowed by the perceived improvements.

Approaching the Asian crisis in Indonesia from an historical perspective will not only tell us about the nature of the crisis in 1997 but also the character of the green revolution twenty years earlier.

1.2.3 Setting the time frame

This thesis covers the period 1969 to 1996.The initial idea was to cover the fifty years of Javanese agricultural development, from independence in 1950 to the end of the Suharto regime in 1998. At the time of the crisis Indonesia had only had two rulers and the development under these two could, despite the violent end to the Sukarno regime, be seen as a continuous process. It soon became apparent that this was not a suitable strategy as the Sukarno years were chaotic, economically as well as politically. While agricultural development was high on the agenda during the Sukarno regime, the country was in such a sorry state of affairs that any development efforts were more or less doomed to fail. The regime would time and again instigate grand development plans but nothing much came out of them (Bresnan 1993:115-116). In addition, data and other sources on a local level for this period are extremely hard to come by and are not very reliable. Furthermore, interviews with farmers and, more importantly,

village officials from the time prior to Suharto's takeover proved very difficult and uncertain. Consequently, a decision was taken to cover only the Suharto era, or the New Order as it became known. To start the study in 1965, the year of the coup, would, however, not be a good idea due to the chaos from the previous regime. Suharto did not gain full control in Indonesia until 1967, after one of the bloodiest aftermaths of a coup in modern times.[2] After taking power, the first issues were to get the economy back in shape, battle hyper inflation and improve the legitimacy of his regime, rather than focusing on the agricultural sector(Hill 2000:15). The study therefore begins in 1969.

The most obvious year to end the analysis would seem to be 1997, the year of the crisis. This would, however, pose a few problems, the most serious being that all statistical data from that year and onwards are heavily influenced by the crisis. It is then better to finish a year or two prior to the crisis, when the Indonesian economy was in a state of normality. Furthermore, when interviewing about recent years, the considerable influence of the events of 1997 is bound to take focus away from the period under study. As a result the time frame of this study is 1969 to 1996.

1.3 Agriculture in the 'East Asian Model'

1.3.1 Defining the 'East Asian model' of development

When looking to explain economic development in East and Southeast Asia, researchers often refer to an 'East Asian model' of development (see Adelman 1984; Oshima 1987). This 'model' of development is therefore a creation of scholars after the event, trying to explain the transformation of a region from being a lost cause in the early 1950s to being an inspiration for the rest of the developing world, only fifty years later. As other countries, like Indonesia, have looked to the East Asian miracle economies for advice and inspiration, the 'East Asian model' of development has moved from the desks of academics to the actual corridors of power in these countries, and has been turned into policy (see *Repelita* (1969): chapter 1).

It was thus a Northeast Asian trajectory of development that was elevated to a model by the latecomers in their striving to become like 'Japan inc.'. In any case it is safe to conclude that there is something which can be termed the 'East Asian Model' of development. So what does this 'East Asian Model' entail? Is

[2] The coup attempt in 1965 was followed by a merciless hunt for communists across Indonesia. The precise number killed in the atrocities remains unclear but ranges from a couple of hundred thousand to about one million.

there a model or have these countries developed very differently but followed some loose concept which includes the same criteria? As this study attempts to explain the development in Indonesia under the Suharto period, the 'East Asian Model' is suitable as a point of departure. The aim of this section is thus to determine, with the help of an historical context, what constitutes the 'East Asian Model' of development, and in particular, the role of agricultural transformation in forming this development model.

1.3.2 The agricultural sector

Large parts of Asia are covered by monsoon rains. As a consequence, wet-land-paddy agriculture is the most predominant mode of cultivation (Oshima 1987:18-21). This type of cultivation has both advantages and drawbacks. Marx coined the concept 'Asiatic mode of production', which reflected the extreme labour intensity in paddy cultivation (Marx: 1970). The system worked on the basis that production could be increased a little bit more by increasing the labour force. The yields per hectare increased as a consequence of farmers using the most productive seeds, which had been selected over thousands of years, in combination with extensive irrigation systems (Oshima 1986). When modernisation of agriculture started in England with the enclosure movements, Asian yields per hectare were already very high. Despite the yields being high, there was only ever enough to feed the increasing population and resources could not be transferred into other sectors of the economy (Oshima 1986:36). In real terms this meant that all resources were used to feed the growing population while other more lucrative activities such as husbandry were difficult to engage in (Oshima 1986:37). A lack of husbandry did not just mean lost income opportunities, but also that agriculture could not benefit from the use of beasts of burden. Monsoon Asia suffered from a poverty trap that was almost impossible to break out of as the farmers had access only to inferior technology, giving them no choice but to keep increasing production through labour intensive methods (Elvin 1973).

To make matters worse, the nature of paddy agriculture is such that there are very labour-intense periods followed by periods when virtually no work needs to be done. This leads to not only uneven income for the agricultural population over the year, but also difficulties in establishing industries that need labour all the year round. In short, Asian paddy agriculture had reached its limits. Yields were high, but as labour productivity was more or less unchanged, there was little prospect of developing the economy any further. This was the situation in East Asia before the Second World War.

In early development theory, agriculture played an insignificant role and was seen as an inefficient labour abundant sector with few prospects for development. The early strategy was more or less to leave agriculture behind and industrialise with the help of the labour masses not needed in the rural sector. As labour flowed to sectors with higher productivity, the whole economy would be influenced positively. Nurkse, for instance, argued that at the core of increased consumption lay increased real income, which could only be realised through increased productivity (Nurkse 1953:9). In order to increase productivity it was crucial to channel resources to the more productive industrial sector (Nurkse 1953:9). This more dynamic sector would then create linkages within, as well as between, sectors as small industries are complementary and cater for each other's needs (Nurkse 1953:11). In this way all parts of the economy could reap the benefits from development of the industrial sector.

In Lewis' influential model, agriculture was to provide industries with redundant labour without production in agriculture suffering, and there would be an increase in the industrial labour force at a low cost. The idea was thus that those unemployed or underemployed in agriculture who moved out of the sector would not affect production but would in fact increase the productivity of labour (Lewis 1954). Lewis argued that labour could be transferred to the industrial sector at constant low wages, which could accrue to the industrialists in the form of greater profits, which could be invested in better technology (Lewis 1954). This was, however, according to Oshima (1987:49), not the case in post-war Japan, as there was evidence of increasing wages in both agriculture and industry. Perhaps more importantly, the farmers remaining in the sector could not cope with the work load once the labour-intense seasons arrived (Oshima 1987:52-55). For this practice to actually work labour productivity in agriculture needs to be increased. It is thus important to increase productivity in the Asian economy so much that the labour transferred to other sectors does not have an adverse effect on agricultural production when labour demands are at their peak. Consequently, the parts of cultivation needing mechanising are those that deal with harvest and working the soil, i.e. the most labour-intensive tasks. Weeding and other activities not requiring large amounts of labour do not need mechanising as urgently (Oshima 1987). Thus, in order to break free from this low labour productivity trap successfully, something had to be done. Let us now turn to some examples from Northeast Asia.

1.3.3 The model in East Asia

With the advent of the Second World War, Japan was still very much a country characterised by labour intensive agriculture with half the population feeding the other half (Oshima 1987). The Meiji regime had recognised the importance of increasing agricultural production through agricultural research and extension. Although there were efforts to modernise Japanese agriculture, labour productivity as well as technological standards remained low, resulting in food production not covering the needs of the nation. In addition, the farmers were heavily taxed, which, of course, did not help them to modernise their practices and yields increased very slowly. As agricultural income stayed low the domestic market needed by the industries was very small.

Japan soon recovered after the war and became an economic giant. The source of this change was in the economic policy which paid greater attention to the agricultural sector. The first important action taken by the American occupational forces was to initiate a land reform. The reform tackled the problems of absentee landlordism but also targeted the large landholders as no family was allowed to own more than ten hectares (Kawagoe 1999:27). Because of this, the proportion of land worked by tenants decreased from almost fifty percent of the land to about ten per cent (Kawagoe 1999:31). In addition the rents of land under tenure were very low. Post-war Japan needed all the food it could produce and the smallholders prospered and were able to repay the debts built up when purchasing the land (Kawagoe 1999). In just a few years the structure of rural Japan had changed from one dominated by a landholding elite to a sector dominated by small, independent and relatively prosperous farmers (Reischauer and Craig 1990:287).

With the new class of farmers making a profit from their land, there was an increased use of new biological/chemical and land augmenting technology. The problem of Asian agriculture and thus also of the Japanese was the seasonal variations in labour demand (Oshima 1987). With improved irrigation this was levelled out to a large extent, giving the farmers a source of income from more harvests spread out more evenly over the year. The farmers' income thus increased drastically not just from new, higher yielding varieties but also from the levelling out of seasons (Oshima 1987). With the increased income there were demands for crops other than rice, which would be grown at other times and increase the work opportunities. In addition, these crops were often more labour-intensive and thus helped even further as they could absorb any unemployed agricultural labour. Japan soon came to a stage when low yields were no longer an issue. It had achieved full employment and wages in

agriculture kept increasing, partly as a consequence of labour shortages. While this, of course, contributed to the domestic market, it meant greater costs for the land owners. As a result Japan entered the next phase, which, as Adelman has highlighted, was a crucial step towards successful modernisation (Adelman 1984:938). Japan embarked on the road towards mechanisation and left labour-intensive agriculture behind, a process in which the extension system from the previous regime played an important part. In addition, the farmers had high savings thanks to increased income and could also utilise cheap credit. In combination with increasing real wages and competition from the modern sector of the economy the farmers were left with little choice (Oshima 1986:792). At the end of the 1970s one could find a host of different mechanical devices in a Japanese agricultural household as man was substituted by machine (Oshima 1987:116). Japan moved out of the first stage of the intensifying process and quickly turned to labour-saving technologies as labour absorption was no longer high on the agenda.

The core of the model of agricultural-led growth in Japan was to increase productivity, farm income and real wages equally with the help of land reform, which created an impetus for domestic industrial growth by providing labour, without compromising production, and a domestic market. It is worth noting that Japan used a model that advocated labour intensive agriculture in the initial stages but then moved on to become one of the most labour productive countries in the world.

Perhaps the most interesting cases, when discussing an ‘Asian model of development’ are Taiwan and South Korea. Although different from Japan they do share common themes in the development process. In both countries, as in Japan, land reform played an important role (Chen 1994:1759; Jeon and Kim, 2000:254-255). With land reforms the old elites were removed and an agricultural base of smallholders was created, implying that polarisation of rural society could be avoided. Agricultural modernisation increased output, productivity and income for the masses, thus creating a broad consumer base for the domestic industry (Oshima 1987; Ramachandran, 1995:380).

As in Japan, there was a second phase of modernisation in Taiwan and somewhat later in Korea. Although agriculture had served as a labour absorber in the initial phase, there was a growing demand for labour from the industrial sector. Labour flowed to industry which offered higher wages, driving them up in agriculture and forcing the farmers to mechanise and so increase labour productivity (Oshima 1987:149ff)

Thus both countries successfully modernised through agricultural transformation, entailing high yields and labour productivity with increased

income equally distributed. Finally, it is also important to see the sequence of modernisation as agriculture took the lead before industry, ensuring that both sectors were dynamic, creating a nexus for further development through agricultural demand-led growth (Kay 2002).

It is clear that in all three countries the remarkable success after the Second World War was achieved with the help of a dynamic agricultural sector as the engine of growth in the initial stages of modernisation. At the core of the policy, although differing from country to country, three issues played a significant role.

First, there was an increase in production. Initially this had been done at the expense of labour productivity as the sector also functioned as an absorber of labour, but, and this is crucial to the model, as industry grew, the demand for labour increased, resulting in a flow of manpower from agriculture and forcing the former to mechanise and thereby increase labour productivity. As a consequence, looking over the whole period the agricultural sector became highly labour- and land-efficient. While the sector, in the initial stages of development had absorbed excess labour, and production increased faster than the labour force, the absorption did not affect income adversely. In fact income in agriculture constantly increased, providing the industrial sector with a domestic market and thus stimulating growth. Finally, the new found prosperity was equally divided. Elites were removed and agricultural policy benefited the majority.

1.4 The ‘East Asian Model’ and Indonesia

From the discussion above it is clear that there has been an ‘East Asian Model’ of development in which the type of agricultural modernisation plays a key role. Although the countries in the northeast have differed in their development and have perhaps put emphasis on different issues, they have all followed a similar path beginning in the agricultural sector. It is also clear that Indonesia had in fact explicitly stated it would follow an agenda that more or less corresponded with the one practised by the countries in eastern Asia. Yet, according to Booth (2002), the model used in the North Eastern parts of Asia was very different from the one practised in most of Asia, including Indonesia. Booth argues that agricultural development in Southeast Asia has been much more unequal with lower levels of labour productivity and slower growth (Booth 1999; Booth 2002:44). Perhaps it also meant that these economies were more vulnerable to a crisis. This leads to the overall research question of the present study: what were the driving forces behind agricultural development and why was the agricultural

sector apparently not resilient in the face of economic downturn? Perhaps Booth has the answer, but this question warrants a thorough examination and for that purpose three more specific issues need to be addressed.

First, how did yields per hectare and labourer change during the New Order? This was a crucial point in the 'East Asian Model' and needs to be carefully examined in the case of Indonesia as well. Second, how did per capita income in agriculture change during the course of the New Order? It was increased per capita income in agriculture that allowed for capital transfers and a growing market that fuelled the miracle economies and made them less vulnerable to the world market. Finally, how was income and wealth distributed during the Suharto years? Who gained and who lost out in the development process? Answering this will contribute to understanding the driving forces behind the development in Indonesian agriculture.

It could be argued morally that equity is the foundation of a just and fair society. Race, creed and sex should not determine an individual's opportunities in life (World Bank 2005). In the 'East Asian Model' of development, however, equity was not only an outcome of economic policy but initially also at the core of the model, not least in the shape of land reform, which created an initial equal distribution of both income and opportunity.

1.4.1 Productivity

Productivity can be measured in returns to labour, land and capital. Only returns to labour and land will be discussed since capital is very scarce in the agricultural sector. It is very important to distinguish between gains in returns to labour and to land and it is crucial that both increase if the agricultural sector is to prosper. Increased production can at first be achieved by putting more land under cultivation. As population pressure increases and land is used for other purposes such as housing, infrastructure and industrial estates, scarcity will become a fact and the yields need to be increased through land-augmenting procedures, rather than mere extension of land areas. While yields are important in order to feed the population and initially absorb excess labour, labour productivity is crucial for economic development in the long run. It is through increasing returns to labour that capital, food and manpower, needed in other sectors of the economy, can be released (Oshima 1987:49). If the yields of the land increase while the productivity of labour decreases or remains stagnant, the sector will produce more food but without increasing the per capita income in rural areas, leaving it to stagnate. This leaves less room for consumption and the

creation of a domestic market, and makes it more difficult for the farmers to invest in new technology.

As a consequence, this study will look at land augmentations and increased returns to land, but, more importantly, focus on the introduction of labour saving technologies and the development of labour productivity.

1.4.2 Per capita Income

Income is one of the key criteria in the development process. Increased per capita income in agriculture has several implications, the most important being its impact on poverty. Historically, the masses of poor have resided in rural areas and thus any income growth will have the largest impact here (Mellor 1995). In addition, as per capita income grows, conditions for creating domestic industries will improve. The increased income in rural areas will thus help to drive economic growth for the economy as a whole when a new consumer base is established. In the Indonesian case, this is of great importance, as a scrutiny of agricultural income helps to reveal not only efforts to reduce poverty, but also how far from the poverty line these people are. In this thesis it is not just the income of the landholders that has been studied, but also that of the growing group of landless.

1.4.3 Equity

In the East Asian case the third leg of the model was equity, which was an effect of the policies carried out and entailed an extensive land reform in Japan, Korea and Taiwan. Hence, the motives were political, in an effort to break old elites, rather than economic (Reischauer and Craig 1989). The outcome was a more equal society with more evenly distributed wealth. Although this equity was driven by politics, and not economic considerations, there are a number of reasons why equity is important in any development process. These also help to explain why some countries have been more successful than others.

First, it is evident in many parts of the world that a few of the citizens enjoy the benefits of economic growth, while the masses are still living in poverty (Eischer and Staatz 1998:16). Many economists believe that as long as there is economic growth the new riches will ‘trickle down’ to the poorest in society. This has seldom been the case and political measures often need to be taken for redistribution of the new-found wealth.

Another, perhaps less altruistic, reason for a more equal distribution of wealth is that, with the increasing gaps between groups, social tension will

mount. Those countries that have not paid attention to the redistribution of wealth have often seen themselves involved in civil wars, *coup d'états* or other calamities which have reversed their fortunes (Eicher and Staatz 1998:16).

Finally, and perhaps most importantly, there is the equal opportunity argument (World Bank 2005). It is argued that equity in itself will stimulate development and economic growth. In essence, an unequal society wastes productive opportunities and resources are allocated less than optimally(World Bank 2005). In an unequal economy the size of credits will vary, depending on the borrower. This system more often than not discriminates against the small and the poor, and many opportunities for profits in small business ventures are lost. Similar discrimination against the poor affects many aspects of economic life including land rent and human capital (World Bank 2005:7-8). In addition, an unequal society perpetuates itself as the elites have little interest in changing a system beneficial to themselves, leading to a continuation of a less than optimal production (World Bank 2005:8-9).

In Suharto's Indonesia, growth, stability and equity were the main focus of state policy (Sajogyo and Wiradi 1985). The three tiers of the development strategy were closely connected and it will be argued here that it would have been difficult to achieve the other two satisfactorily without equity. Greater equity would have led to political stability as society was not disrupted by disgruntled groups. Likewise, economic development would have benefited immensely from equal distribution of opportunities as these would entail a better use of resources (World Bank 2005).

In this study, equity is measured using a number of sources. First, expenditure data is gathered from the Central Bureau of Statistics (BPS). This type of data gives a somewhat unclear picture of equity in Indonesia and is therefore complemented with information on landholdings which may be used as a proxy for accumulated wealth and savings. To strengthen the analysis, poverty reduction is used in the study of differences between rural and urban areas. This will give an indication of the government's dedication eliminating to rural and urban poverty respectively.

1.5 The area studied

Because of the great diversity in Indonesia it is impossible to apply findings from one island to another and practically impossible, given the time and resources for this project, to cover more than one island. Hence, Java is the island under study. Since covering the whole of Java is also a formidable task,

further restrictions have had to be made and only a general view of Java is included with a case-study of the Special Region of Yogyakarta.[3] As seen on map 1.5a, the region is centrally situated in Java along the coastline of the Indian Ocean. Yogyakarta consists of four regencies, Sleman, Bantul, Gunung Kidul, Kolon Progo and Yogyakarta. The province is the smallest of the provinces in Java with only about three million inhabitants. It is best known for being the cultural and academic capital of Indonesia, and as one of only three provinces it has been granted special status with certain autonomous liberties.[4] The province is ruled by a Sultan who is not elected by the public. Despite the dominance of the city of Yogyakarta, the majority of the population live in rural areas (Dinas 1997). Agriculture plays a decisive role both in economic and everyday life. Although small, it can still be said to be representative of the island as a whole with both arid highlands and fertile wet lowlands. The arid areas are not so densely populated and the rural population is poorer than in the wet regions. With these aspects in mind Yogyakarta fits in well with the two ecological regions of the island (Hefner 1990:5-7)

The two regions of Bantul and Gunung Kidul have been chosen for a closer examination. As seen on map 1.5b below, the two regencies are situated next to each other but are very different in character. The regencies have been chosen for their geographical as well as economic and ecological characteristics. Bantul is the richer of the two regencies (BPS, *Yogyakarta in Figures* 2002). The average village has a much larger income and a lot more to put away at the end of the year. Furthermore, Bantul receives a much smaller sum in aid from the government, which should be an indication of greater wealth (BPS, *Yogyakarta in Figures* 2002). Another characteristic of Bantul is that it covers a part of greater Yogyakarta today. Only the centre of the city is in the regency of Yogyakarta; the rest is spread out in the regencies of Sleman and Bantul. Although the focal point of this study is the rural area Yogyakarta, it is, of course, interesting to study the connections between the rural and urban economies. The villages in Bantul have therefore been chosen with this in mind. I have studied one village close to the city of Yogyakarta, one a bit further away and one far off. Another interesting feature of the Bantul area is that it is a humid region with plenty of rainfall. As the regency of Bantul is wet, the most prominent crop is wet rice, and is planted at least twice annually. The farmers in Bantul grow rice not only for their own needs but also for the local market.

[3] The Special Region of Yogyakarta is henceforth referred to as Yogyakarta.

[4] Yogyakarta is one of the old sultanates in Java. The region as well as its Sultan played an important role in the battle for independence, serving as the capital in the late 1940s and as a consequence the region was granted special status.

As one may expect, Gunung Kidul is quite the opposite of Bantul. It is much poorer, receives much more help from the government and is farther away from any large city like Yogyakarta (BPS, *Yogyakarta in Figures* 2002). Furthermore it is mountainous and arid, which mean lower yields. This area therefore serves as a good contrast to Bantul. As it is dry, wet rice is rare. Instead, rain-fed rice cultivation is the most dominant method used. Rice therefore plays a secondary role to other crops such as vegetables and ground nuts. In addition, while rice in Bantul is grown for the market, the farmers in Gunung Kidul, predominantly grow the crop only to meet their own needs.

Finally, from a purely demographic point of view, the two regencies serve as a good reference for Java. Though Gunung Kidul covers three times the area of Bantul, the populations are more or less the same, making the former much more scarcely populated (BPS, *Yogyakarta in Figures* 2002). Given the mountainous conditions in Gunung Kidul proximity, to the nearest urban centre is of importance, as is the altitude of the village since this has an impact on access to water, etc. In Bantul the dominating city is clearly Yogyakarta. Although it plays an important role in Gunung Kidul, the city is less accessible and therefore another urban centre, Wonosari, has been chosen. Wonosari is the regency capital and serves as the political, and for the most part economical centre for the farmers.

Altogether, six villages, evenly distributed between the two regencies of Bantul and Gunung Kidul, have been chosen for a general study.[5]. Below follows a description of the villages in Bantul and Gunung Kidul, selected to give a general view of the two regencies. Two of the villages have been chosen for more in-depth study and are described in more detail.

1.5.1 The villages in Bantul

Three villages in three separate districts (*kecamatan*) have been chosen in Bantul. Firstly, the village of Sumber Agung, situated in the kecamatan of Jetis, has been chosen for its location close to the city of Yogyakarta and is only a twenty-minute ride from the city or 9 kilometres from the city borders.

[5] When choosing villages to study, there may be a risk of so-called spatial or tarmac bias, meaning that the researcher has chosen villages or areas close to urban areas or at least to the main roads. This would entail that the comforts of the researcher have guided the choice of the villages (Chambers 1983:18). In Java in general and in Yogyakarta in particular, however, the villages are very close together and fairly close to a decent road. Of course there is varying quality in infrastructure, which is most apparent in the regions farthest away from Yogyakarta. As it is impossible not to choose a village close to a road, this risk of bias is non-existent.

Furthermore the village is ideal as it represents an area dominated by wet rice fields that are harvested twice a year. In addition, the village has been chosen for its economic features as it is considered rich and has strong ties to the regional capital. In fact, most of the citizens, not in school or retired, have other work in the city to complement their agricultural income.

The second village, Gading Sari in the kecamatan of Sanden, has been chosen as it is over 20 kilometres away from the city of Yogyakarta and therefore less likely to have close contacts with it. It has also been chosen because of its ecological features; it is in a relatively dry area and close to the sea. Again, the villagers chosen for the study constitute a sample of all age and income groups. All in all ten farmers and the head of PPL have been interviewed.

The third village is Sri Hardono in the kecamatan Pundong, chosen because it is farther away from Yogyakarta. Of the three villages in Bantul, this village is well suited for more in-depth studies and has been chosen for closer study for three reasons. Firstly, its proximity to Yogyakarta, as it is near enough to be influenced by the city which gives job opportunities, as well as markets for their produce, yet not as far away as villages in Sanden nor as close as Sumber Agung. It has also been chosen for its level of income as it is not as rich as Sumber Agung but not as poor as Gading sari. It is also a village very typical for Bantul as it consists of mainly irrigated rice fields. The ecological setting right in the middle of the well irrigated heartland makes the village somewhat of an archetype for the green revolution in Indonesia. This means that it is suited for 'the Indonesian development model' and deserves extra attention as it has played a crucial part in the rice self-sufficiency goals. The village has roughly 12000 inhabitants, of which half are landless. The average landholding has changed over time but it is at present around 0.3 hectares per household (Ekbang Sri Hardono, Bantul 2006). The village is about 15 kilometres from Yogyakarta on one of the major roads through Bantul from Yogyakarta to Parangtritis, granting it good access to the provincial capital. In addition, Parangtritis, with its long sandy beach, is one of the more important tourist attractions in the area and thus provides extra off-farm income sources. Furthermore, the village has been chosen as it is in a drier area of Bantul and thus may bear a greater resemblance than Sumber Agung to the villages chosen in the regency of Gunung Kidul. In addition it is poorer than Sumber Agung and therefore may have experienced the development of the agricultural sector in Java somewhat differently.

1.5.2 The Villages in Gunung Kidul

As mentioned above, three villages have been chosen in Gunung Kidul. Similarly to the villages in Bantul, these three have been chosen with respect to distance to the closest urban centre, Wonosari. Since Gunung Kidul is a very mountainous area, attention has also been given to their altitude. As in the case of Bantul, the villages chosen are situated in three separate kecamatan.

The first village, Duwet, in the kecamatan of Wonosari, is only 4.5 kilometres from the regency capital, near enough to make Wonosari the main market. The main occupation in the village is farming, but there are a number of people who have other sources of income. The main crops are dry crops but since the late 1970s there have been a number of pumps installed that allow rudimentary irrigation. The farmers grow rain-fed rice in the area.

The second village, on a higher altitude and farther (9 kilometres) away from Wonosari is called Ngeposari and is situated in the kecamatan Semanu. Although farther away from Wonosari than Duwet, it is on the main road and, thanks to the transport revolution in the mid 1980s, the city is easily accessed. The village is in a very dry area and rice plays a secondary role to dry crops such as groundnuts and beans.

The third and final village is Ponjong, which has also been chosen for intense, in-depth interviews. Wonosari is about 45 minutes drive from Ponjong and another hour to Yogyakarta. It is also the one situated at the highest altitude. The principal reason for choosing it, however, is that it is one of the few regions in Gunung Kidul where wet rice is common practice, which makes it similar to the conditions in Bantul. This is the result of a dam, constructed in the mid 1970s, which provides the irrigation system with water and enables the farmers to use a method similar to Bantul. The farmers in Bantul have up to three rice crops a year, but the wet rice farmers in Gunung Kidul only have one harvest a year. In addition the village obtains an extra income in the dry season from selling truckloads of water to other drier regions in Gunung Kidul.

The villages of Gunung Kidul are considerably smaller than the ones in Bantul. Ponjong has almost five thousand inhabitants, of which about ten to fifteen per cent are landless. It is interesting to note that a large number have gone to work in other areas of Indonesia or abroad (Ekbang Ponjong, Gunung Kidul 2006). The village is in the mid-range of income level when compared to the others in Gunung Kidul, but still below the level of Sri Hardono in Bantul.

1.6 Some methodological concerns

As always a study of this type is highly dependent on the availability and quality of the data. In this thesis information is drawn upon from statistical data primarily from the Central Bureau of Statistics (BPS), oral sources from villages and state agencies and secondary material from archives, libraries and institutes both in Europe and Asia.

As a consequence the study combines qualitative and quantitative sources. The quantative part of the study gives a description of the development in Javanese agriculture during the New Order, but a more qualitative approach is applied in order to understand the reasons for changes in the development. It is the hope of the author that the study captures some of the people and lives behind the statistics.

1.6.2 The statistical material

In the case of the data collected there are no objectivity problems, but this does not make it any easier. In general Third World data is shaky and should be treated with utmost care. This is also the case in Indonesia. In Java, data on rice harvests has since colonial times, been calculated on the production in small plots, which have then been multiplied with the number of hectares under that type of crop. The plot chosen as a reference plot has thus had a crucial impact on the average of the island as a whole. Several studies from the late 1960s show that plots were not carefully chosen, causing production to be erroneously estimated (Booth 1988:266). From 1970 onwards the plots were more carefully selected resulting in not only more accurate but also substantially higher figures (Booth 1988:267-268). For this thesis this has no implications in terms of comparison between time periods as the 1960s is of lesser importance here. In addition, there are issues with the reporting of all arable land and the proportion under wet rice cultivation. The figures differ among the various agencies that collect the data, which is perhaps not surprising as the different offices may use different methods when gathering and classifying the data. The big problem is that data differs in the reports published by BPS. Data in publications at national level and local level differs, as do publications such as the agricultural census and population census. Booth has acknowledged this problem for the 1970s and 1980s and unfortunately, when searching for data for this study it was clear that these discrepancies are also evident in more recent publications. The reason is basically that the definition of what constitutes wet land, dry land etc. is not firm. Wet rice, for instance, can be divided into subgroups according to types of irrigation (Booth 1988). Bearing this in mind it is important not to mix the

series. In addition it is the long-term trends that are sought here. The data for any individual year is inadequate but when all the years are taken together it is possible to create a viable image. In addition, interviews and yearly reports, discussed below, can be used to see if it makes sense.

The vulnerability inherent in the system is highlighted as we are forced to assume today that the data is more correct although we are at the peril of the collectors of data.

1.6.3 The oral sources

If the validity of the statistical material is at the mercy of the collector and bureaucracy, the quality of the data can easily be jeopardised by the interviewer and his respondents. When interviewing, there are a number of issues which have to be taken into consideration. First, the respondents are often asked about conditions as far back as 30 years ago. While they do answer to their best abilities, it is not easy for them to remember. As an *aide memoire* the questions here are often attached to some sort of occurrence in the area at that time. For example if there was a dam built in the late 1970s this dam could be used as a point of reference, making it easier to remember. Another method used was to walk around in the fields with the farmers, discussing objects in the immediate surroundings to jolt the respondents' memory.

Secondly, local knowledge is important when conducting interviews. As an interviewer one has to try and adapt to the local context. This is done here through a local interpreter

Third, you only get the answer you ask for. Interviewing in a Javanese context one cannot stress enough how important it is to make sure the questions are open-ended in nature but still allow for long conversations so that all bases are covered.

Finally, in this study the interviewer has strived to achieve as high an objectivity as possible, although this could at times be difficult as the respondents themselves are the objects of the study. These are all problems which cannot be completely avoided, and consequently the most careful measures have been taken in order to avoid any traps.

1.6.4 The respondents

Eight to ten villagers, in each village, were chosen for the study. An additional six farmers were interviewed in each of the two villages.

The farmers were chosen with some specific criteria in mind. First, the size of landholdings. The land controlled by the farmer is very important as it constitutes the base of his income. It is, however, equally important to include the landless farmers as they represent a large proportion of the rural households. Farmers owning less that 0.1 hectares of land are considered landless. Since the two regencies under study here differ greatly in population density the distinction between a large and a small landholder varies between Bantul and Gunung Kidul. In Bantul a large landholder is a farmer with more than 0.5 hectare. In Gunung Kidul, on the other hand, a large landholder has more than 1 hectare. By interviewing farmers of different economic stature, what Chambers refers to as elite bias is to a certain extent avoided and the interviewer can capture village life not only as it is for the richer in society (Chambers 1983:18). In addition, to avoid this not all respondents were found with the help of the village leadership but simply approached in the field at random.

The second and less important criterion when choosing the farmers was their age. The farmers, of course, had to have been farmers during at least part of the New Order era but it was also important to have farmers who had been active during the whole New Order so as to be able to observe differences over the years.

Finally, the economic stature of a farmer changes over time, with children, etc. Interviewing farmers of different ages generally eliminates these biases. As the author and the village officials being male could cause a problem of male bias, care was taken to include women. Women often have knowledge that men lack, and this was most apparent in discussions with the respondents on issues concerning domestic consumption. While the men gave a good image of costs and income from agriculture, they were not so clear on domestic consumption, schooling or social expenditure. Thankfully, the wives of the farmers were often available for consultation when problems arose, so in a way they were implicitly included in the interviews.

In addition to the interviews with farmers, a number of civil servants, both active and retired, were interviewed. These were the men and women who carried out the development plans in the field and offered invaluable information on how the Indonesian development project had been worked in the field.

Finally, as most of the farmers in the village in Bantul had another job of some sort in Yogyakarta, care was taken to interview in the afternoon so as not to miss out on these farmers.

1.6.5 The archives, the libraries and the institutes

Perhaps the most used source of information in a study of this kind is the secondary, written material found in books, periodicals and journals. Here, this material is predominantly used when discussing the bigger image for Java as a whole. This type of information has mainly been collected from academic libraries and institutes, for example the Nordic Institute for Asian Studies in Copenhagen (NIAS) and the Royal Netherlands Institute of Southeast Asian and Caribbean Studies (KITLV) in Leiden, the Netherlands. In addition, many of the departments and governmental bodies in Indonesia offer a variety of periodicals, papers and books.

As the study is only concerned with modern Indonesian history the archives used for this study are all Indonesian. The two principal sources are Central Bureau of Statistics and the provincial agricultural services (*Dinas*). BPS holds archives of annual data on agricultural production, expenditure and income at national, provincial and local level. In addition, there has been an agricultural census every ten years since 1963. There are also other censuses, such as the population census, the social census and the labour census that are conducted on a more regular basis. Although, as discussed above, there have been problems with the data collected, there is an abundance of it.

The archives at Dinas, including annual reports on agricultural development written for internal use only, are more limited and most complete at provincial level. For this study the author was given the privilege of gaining access to these reports from 1967 until 1997, giving a unique view of agricultural policy in Yogyakarta under the New Order. These reports have, over the years, been compiled by the extension system and give an overview of what projects have been carried out in the region. In the reports, the projects are also recorded in detail and to some extent reviewed by the authorities, giving an idea of how well they worked. Of all the sources used in this thesis, the annual reports from Dinas Pertanian in Yogyakarta, is the single most important one. These reports have been compiled since 1967 and offer a comprehensive view of agricultural development in the region when complemented with the other sources. The Dinas archives also contain information leaflets and other types of pamphlets, which give a good idea of the projects carried out. Furthermore, studies have been carried out by the Ministry of Agriculture in Jakarta and are

stored at their scholarly archives in Bogor. Moreover, the provincial and national archives of the National Planning Board have been a good source of information on development policy, with access to the development plans and other agricultural policy documents. As evident from the discussion above, most of the information gathered comes from government sources. It is, however, important to bear in mind that the reports, data and leaflets may very well be biased so as to give a more politically acceptable view of the development process in Java. Being aware of this, it is important to critically assess the reports and to compare them with other sources.

1.6.6 Complementarities and cross checking of the sources

There are basically three contributors to the empirical part of the thesis, the interviews, the archives, the libraries and institutes. As is evident from the discussion above, each source has its advantages and drawbacks. The primary material is shaky and riddled with difficulties, but the secondary material, just because it is written, does not necessarily fare any better as it can be full of measuring errors or the private opinion of the author. Combining the sources, however, allows for a triangulation of information, thereby making them tell a strong story together.

Similarly the interviews and, as mentioned above, the data of the earlier part of the period under study are less reliable. The secondary sources such as books and articles, describing agricultural development in Java from that time, help in reconstructing and completing the picture, thus confirming the reliability of the interviews.

In addition, the empirical data gathered can complement each other. Often, there is ample evidence of state policy on a national or island level in the statistical information, but none is to be found for Yogyakarta. The interviews can help in these cases. Likewise, they help to bring the reports and statistics for Java alive, giving a more complete explanation and lending more credibility to official documents. The source material has thus been combined into giving a more complete picture of the development process in Java.

1.7 Structure of the Study

This study is divided into seven chapters.

Chapter two gives an historical background covering three hundred years of agricultural development in Indonesia. The chapter also aims at reviewing the role that has been given to agriculture in development policy over the years.

Chapter three provides the theoretical framework for the thesis, starting with a discussion on the role of agriculture in development policy, then moving on to endogenous explanations for agrarian change and, finally, turning to other theories in an attempt to uncover the reasons for the direction taken by Indonesia. The chapter concludes with a discussion about urban bias as the root of the slowdown in agricultural development that eventually led to the crisis.

Chapter four, the first of three empirical chapters, describes and discusses the course of agricultural development in terms of land and labour productivity. It also sets the scene for the next few chapters as it gives a description of the main vehicles for development used by the New Order regime. The chapter shows that top priority was given to land-saving measures. While this is only natural in the initial stages of development it is surprising that more efforts were not directed towards labour-saving applications in the later stage of the New Order. Finally, most agricultural development seems to have occurred in the late 1970s and early 1980s

Chapter five discusses income changes in Java throughout the Suharto regime and comes to the conclusion that rice was given top priority, but there were other much more profitable crops that would have been of greater interest to the farmers, had they been given the chance. The diversification programmes may actually have had an adverse effect on farmers' income. The income of farm labourers is reviewed, showing a steep increase which levels out from the early 1980s.

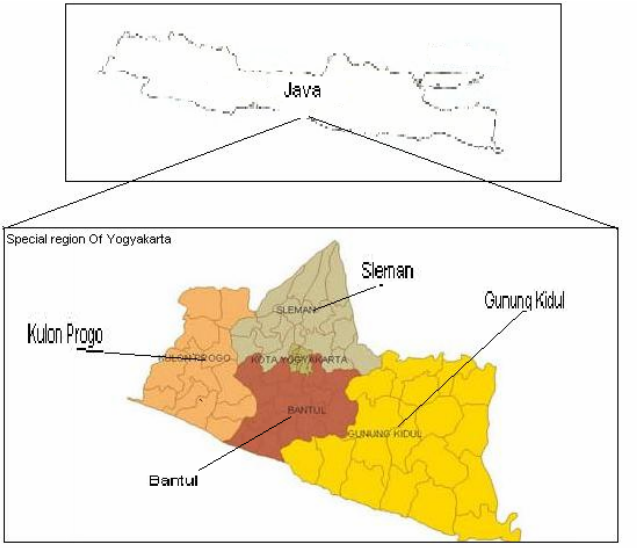
Chapter six covers equity from several points of view. It shows that expenditure patterns in Java as well as in Indonesia have had a cyclical pattern, starting out unevenly but getting better and then worsening again in the 1980s. As for landholdings, another indicator of equity in Java, the development was slightly different. There was a steep increase in the 1970s which was followed by a slower change. However, it did not, improve as expenditure patterns did in the 1980s. The chapter also looks poverty alleviation in Java and a wavelike pattern with the rural sector trailing behind most of the time.

Finally, chapter seven is a summary of the study with some conclusions as to why the whole Indonesian development project faltered in 1997. It also speculates on where Indonesia should go from here. Finally every answered question poses a hundred new ones and this thesis is no different. As a consequence there are also some suggestions for further research.

Map 1.5(a) Java

Source: University of Texas, Cribb 2000

Map 1.5(b) Special Region of Yogyakarta and its districts



Source: Cribb 2000, Government of Bantul

Chapter 2

The Historical Role of Agriculture in Java

2.1 Introduction

While the focus of the thesis is on the New Order regime from 1969 to 1996, it is essential to provide a brief description of the development of the agricultural sector before Suharto assumed power in the wake of the coup that failed in 1965. The era has been divided into two periods, colonial rule and early independence. Particular attention is given to the policies of the regimes as well as the development of productivity and the income and standard of living of the farmers. Giving just an historical overview of Java adds little but general knowledge. In view of this chapter will conclude with an overview of the explanations given for agricultural development, or lack thereof

2.2 Colonial rule

It could be argued that a brief overview of the colonial period is not necessary for a thesis of this sort. It was, however, during this period that the agricultural sector of Java emerged and many of the issues in today's debate have their roots in colonial times.

Dutch colonial rule in Indonesia is generally divided into three periods. The first period covers the Dutch East India Company (VOC) 1601 to 1799. The second period, the cultivation system, followed on the demise of the VOC and stretched roughly between 1830 and 1870 (Chandra and Vogelsang 1999:886).

Finally, a liberal policy gradually replaced the cultivation system, and culminated in the Ethical policy in the early 20th which was in place until the end of Dutch rule (Ricklefs 1993:153). The Japanese occupied Indonesia during the Second World War, but this was for such a short period that we omit it from this overview.

2.2.1 The Dutch East India Company

Dutch colonial rule in Indonesia began with the arrival of the Dutch East India Company in 1601. In the initial stages, however, trade was the main concern of the Dutch (Wolf 1997:237-239). The archipelago was at the time divided into several smaller kingdoms, which were made up of parochial and cosmopolitan cultures with power and economic bases in inland agriculture and trade (Ricklefs 1993). To the Dutch, as traders, the cosmopolitan coastal kingdoms were of greatest interest as it was these kingdoms that provided the spices that were shipped to Europe.

As time passed the Dutch dominance in the region grew and the VOC eventually won supremacy, having defeated colonial and local powers alike (Ricklefs 1993). As the Dutch gained dominance, control over the inland kingdoms became increasingly important since the new masters needed larger quantities of rice and cash crops. The strength of VOC's influence varied from region to region and was based on indirect rule, giving the local lords the right to rule over the people (Steinberg 1987:89, 151-155). In this way the company could control the population of Java through the lords and a much smaller presence was needed. The Dutch then levied taxes to be paid in different crops, which differed from year and region and there were no set rules on how it was carried out (Steinberg 1987). The control of the farmers and the methods of production were thus left to the local elites, and little was changed so that the old patron-client structures prevailed as long as they delivered the goods. Local lords bought themselves positions or bribed themselves out of paying the levies to the VOC officials and a symbiotic relationship between the two emerged. Thus the local lords and the Dutch officials benefited from the system, but left the farmers and the company in a difficult situation, as the farmers were forced to grow crops they did not need or work as corvée labour for the leaders, and the VOC saw little of the profits (Steinberg 1987:153).

In the latter half of the 18th century, the affairs of the VOC became untenable and it was declared bankrupt on the 31st of December 1799.[6] With the demise of the VOC, power was transferred to the Dutch crown. In the first few decades little changed in the way the Dutch colony was run. Gradually, however, there was a move towards a more uniform system based on the need to not just control the people but also govern the new colony and thereby exclude

[6] The bankruptcy of the VOC was predominantly due to the rising power of England and the large deficits the company was running (Steinberg 1987:155). However, the officials working for the VOC in Java were often corrupt and much of the profit ended up in their pockets rather than in the VOC coffers (Maddison1989:17).

the local gentry as well as the old VOC officials from the equation. The new system of rule began in the Dutch strongholds in West Java and then spread throughout the island (Boomgaard 1989a: 12ff).
Despite the new direction of rule, the top priority of extracting funds from the colony in terms of a wide variety of cash crops and the need to supply the Dutch enclave with food, building materials etc., remained and the Dutch reverted to the system of the past. The new tax system introduced by Raffles remained in name but a new system, the cultivation system, was introduced in the early 1830s (Steinberg1987: 157).

2.2.2 The Cultivation system

The Dutch governor General Van den Bosch introduced the cultivation system in 1830. The system was initially meant to increase Dutch income as well as make the lives of the indigenous population easier. It did not take long before the more benevolent aspects were forgotten (Booth 1998:138). The system was implemented gradually across Java but some areas were never reached. Furthermore, while the system was not implemented homogenously and had different effects in different parts, some general characteristics can be seen (Boomgaard 1989a:35). In the cultural system the basic unit of production was the village (*desa*), which was ruled by the local elite. It was thus in the village that the taxes were levied and the peasantry found itself at the mercy of local elites (Breman 1983:6). The Dutch regime had abolished any individual land rights in the villages and it was therefore easier to control the farmers (Breman 1983:9). The farmers were forced to deliver set quotas of cash crops, particularly sugar, to the Dutch. In addition to this they were also forced to provide corvée labour (Boomgaard 1989a 35.39,42). This requirement enabled the owners of the sugar refineries to push labour costs, and was also used for other purposes associated with the development of the export oriented agricultural sector. Roads were built, making Java the Asian colony with the best infrastructure, to facilitate the export of sugar from inland Java. The labour requirement was also abused as the farmers, after they had done their share of work in the Dutch projects, often had to perform household chores and construction for the village leadership. Furthermore, the villages had to clear parts of their land for cash-crop production, thus forcing the farmers to grow more rice etc in smaller fields (Boomgaard 1989a:69).

The villages sold the crops to the sugar factories at fixed prices set by the colonial state. It was either the state or other agencies that worked as brokers

between the villages and the mills. By offering the villages a price for the sugar, an incentive was created to produce more cash crops. The economic incentive, however, did not only lead to increased production of cash crops, but also to village leaders forcing the farmers to grow more cash crops as it was these leaders who benefited the most in the village. Furthermore, the Dutch taxed the farmers in order to extract more income from the Javanese peasantry (Boomgaard 1989a).

There are some disagreements concerning the impact of the cultivation system on Javanese agriculture. It is, however, important to divide the sector into two sub-sectors. The cash-crop sector, which was focused on the international market, and the food-crop sector providing goods for the local market.

2.2.2.1. Production and productivity

While there are some disputes regarding the actual effects of the cultivation system on the agricultural sector, it can clearly be seen in table 2 that the production of cash crops increased dramatically (Boomgaard 1989a; Maddison 1989). In fact, exports of cash crops from Java in the first decade of the Cultivation System literally exploded. After the initial surge, however, the following two decades saw a more moderate annual increase. A decline of this sort was only to be expected as the production increases were due to an extensive growth policy and when the labour and land resources were utilised there was little room for more expansion (Booth 1998:17ff.). As mentioned above, labour was used to improve irrigation and it is therefore likely that the main constraint to higher growth was the lack of labour. Productivity thus increased in terms of yields rather than returns to labour. The direct impact of the cash-crop production was not very large. In theory the cultivation system was an improvement for the farmers as only one fifth of their lands were supposed to be under forced cultivation (Booth 1998:19). The corvée labour requirement negated any benefits the new system might have promised, as the farmers had a decreasing amount of time left for other more lucrative farm and off-farm activities. This is evident as it was only the cash crops produced for the Dutch that experienced an increase in production. Other crops such as cotton and the castor oil plant, which were commonly grown prior to the cultivation system, decreased throughout the period. Tobacco production also decreased until it was incorporated into the cultivation system. When it was incorporated, however, it was no longer a peasant crop as other interests took over. The small amount of tobacco grown on the farmers' own initiative were mainly for the domestic market (Boomgaard 1989a: 94-96)

The colonial regime thus efficiently held the farmers back from the cash crops markets and the increased income which could have been available to them there.

Table 2. Production of cash crops under the cultivation system

	1835	1850	1870
Coffee	21,859	59,162	58,020
Sugar	21,510	86,865	135,348

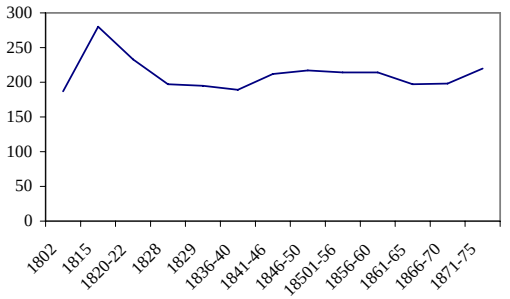
Units in metric ton

Source: Van Baardewijk (1993)*The Cultivation System, Java 1834-1880' Changing economy in Indonesia*,

In conclusion, it is clear that the new system had a negative impact on the farmers. For the plantation economy the situation, as expected, was completely different. As mentioned above the production increased dramatically and much faster than the population. This naturally led to an increase in the productivity of the farmers. Some figures suggest an extreme increase, but if the fact that the farmers had to spend more time on the crops is taken into consideration, the increase is not that dramatic (Boomgaard 1989a:97). It is important to remember that these figures are calculated for the entire agricultural sector and it is likely that the estimates for the cash-crop sector alone were far more impressive (Boomgaard 1989a).

The effects on the food-crop sector are less certain. Maddison argues that the food-crop production was stable throughout the period but the labour requirement increased (Maddison 1989:20). This would indicate that production during this time became increasingly labour-intensive. Boomgaard, on the other hand, shows that there was a decline in the production of rice and of cash crops for the local market. The heavy requirements mentioned above also had a harsh impact on the farmer's ability to grow crops other than the ones the colonial regime wanted (Boomgaard 1989b). Before the cultivation system was in place, farmers grew rice once and then a dry crop of some sort in a normal year. The land requirement, however, forced the farmers to give up a part of their land for up to 16 months, not only affecting the rice production but also the dry crops. Furthermore, the transformation of land required labour and the new crops were more labour-intensive (Boomgaard 1989a: 35,82-83; Alexander and Alexander 1978:213). The changes in productivity in the food-crop sector are not very impressive as the trends clearly show a declining labour productivity during the whole cultivation system (Boomgaard 1989b: 111).

Figure 2. Unhusked rice per capita under the cultivation system (in Kilos)



Source: Boomgaard 1989b:122

2.2.2.2. Income under the cultivation system

As seen in the figure below, the farmers' income during the cultivation system is also a dire read. As is evident from the description of the cash-crop sector above, the farmers made little profit from this. They were either formally excluded or there was simply no time left in the day to grow the crops they wanted. Instead the spoils from the vibrant cash-crop trade in Holland and other places went into the pockets of the colonial masters and, to a certain extent, the village elites. The other option was to sell food crops. This would have given the farmers a larger profit than the cash crops, but as they were forced into cash-crop production there was no time for food-crop production. The income of the farmers decreased as a result of the colonial policy (Boomgaard 1989a:99).

In absolute numbers the income declined heavily at the beginning, and then as time went on it slowly increased and was higher at the end of the cultivation system. But if we take into account the fact that the farmers had to work longer hours, their income was actually decreasing over the time period (Boomgaard 1989a:99-100). As mentioned above, there are a few disputes regarding the farmers' income. Elson argues that the cultivation system was exploitative but the standard of living for the farmers actually did increase (Elson in Boomgaard 1989a). This was possible as the crop payments in general were higher than the land rent. The crop payments increased faster during the cultivation system and the farmers could eventually put a small sum away each year. As the farmers gained an additional income they could choose when to sell their rice and thus waited until the price was right, thereby making a profit on both food and cash crops. The new irrigation systems and transport facilities also enabled farmers in

areas affected by the Cultivation system to buy rice and other food crops from the new rice basins of Java. Despite this evidence put forward by Elson, there are some difficulties with his reasoning. First, when looking at the numbers, the situation seems to have improved, but at the same time Java repeatedly faced starvation and famines, indicating that this was not the case. Furthermore, the famines occurred after the cultivation system had been in place for some ten years, which indicates that the farmers' economic position was gradually eroded.

Second, as is highlighted by Boomgaard (1989a:100), Elson's studies are based on only a small part of Java and it is not wise to generalise these results for the island as a whole.

To conclude, the emphasis of the colonial policy was on the production of crops that fetched a high price on the world market. The consequences were stagnating production of food crops and declining incomes for the peasantry. The Dutch, under the cultivation system thus successfully drained Java of the resources and capital that are normally associated with a booming export industry. Instead, Java faced several famines during the mid-1800s while the Netherlands prospered. Despite the success of the system in the eyes of the Dutch colonial masters, it was not to last, as a more liberal system based on *laissez faire* was gradually introduced.

2.2.3 The liberal and ethical policy

The time period after the cultivation system is at times divided into two. The liberal policy dating from the end of the cultivation system until the turn of the century and the ethical policy covering the first four decades leading up to the Second World War. However, the periods are discussed as one in this thesis.

Although the cultivation system is generally dated between 1830 and 1870, it already started to erode in the 1860s (Boomgaard 1989a). The new system was not so much a result of the situation in Java but of the political changes in Holland. A new, more liberal, regime was in place in The Hague. The belief was that the replacement of the interventionist cultivation system for a liberal system would stimulate private foreign interests in the economy and that it would help in the development of the indigenous sector (Boomgaard 1989a 36). In the new system the state had only a small role in the production and sale of cash crops. As a result, private interest in cash crops grew and private banks became heavily involved. As many plantation owners found it difficult to pay their debts to the banks, it was often these who in actuality ran the plantations. To the state this mattered little as its main source of revenue was taxation. By 1895 more than 40 per cent of the colonial revenues had come from taxes, which in turn meant that

a decreasing part of state income came from their own plantations (Booth 1998:141). The new role of the state was to provide the private sector with infrastructure etc. in order to facilitate economic growth (Booth 1998:141-144). Large sums were also spent on the war fought in Ache more or less throughout the rest of the 19th century. The development of the agricultural sector was thus no longer an issue for the colonial regime. Furthermore, the new liberal policy meant that the monopolies formerly held by the Dutch state were abolished. The change in colonial policy also had an effect of the growing importance of cash crops being grown by small holders in the outer islands. This, in combination with the depression and steady decrease in sugar prices, led to the decline of Java as an important cash-crop producer in the Dutch colonial empire (Booth 1989:68-69).

The effect of the liberal policy was that the export surged for a brief time in the early 1880s only to go down to a more general level again after a few years (Booth 1989:68). Furthermore, as seen in figure 2(a) above, the increase in rice production seems to have been marginally larger than the population increase, which indicates that the productivity did not increase particularly fast. Besides, the closing of the land frontier meant that there was no more land for production of sugar or rice and, as the two were competing and the Dutch were more interested in sugar, it is plausible to assume that sugar crowded out rice.

While the new liberal approach had some success in the cash-crop sector, it did little for the indigenous population. A royal report from 1901 spoke about the alarming state of the indigenous sector. It may have been the case that the authorities were exaggerating the state of affairs, but it remains a fact that the level of income of the farmers in this period continued to be low if not declining (Prince 1989:209).

Despite the laissez faire policy adopted by the Dutch, they did invest in some areas such as the above-mentioned infrastructure and irrigation, which benefited the cash-crop sector. At this time, however, there was also an increasing effort directed at education, health and other social projects. Although there was a shift in policy to a more development-minded one, it is important to bear in mind that the Dutch colonial government, in an international comparison, did less for the indigenous population than, for example, England (Prince 1989).

At the turn of the century the Dutch policy changed once again. The reports of hardship and suffering coming from the colony increased the call for new policies in regard to management of the colony. The Dutch once again turned to a more interventionist regime but this time in order to improve the conditions for

the Javanese (Booth 1998:157). The ethical policy was conceived to improve the income distribution, and to remove the exploitative features of the old systems.

The overall effect was that the interventions made in the colony were aimed at improving conditions in the country rather than siphoning out the capital. The wars in Indonesia were momentarily over and the taxes levied could be used for other purposes. Although this did not happen right away, there was a gradual process of building up the welfare of the colony. The colony's finances were separated from the Dutch and they could take loans in order to finance new development projects. The new direction taken by the colonial government cannot only be seen in the growing budget deficits but also in actual changes in Java. In the 19th century the road network had been given priority at the end of the liberal policy, and the emphasis on railroads and the network grew extensively. The road network did not grow much in terms of kilometres but the quality of already existing roads increased (Booth 1998:149-151).

It was not only the infrastructure that was improved during the ethical policy but also the irrigation system that had a direct effect on the agricultural sector. Per capita availability of rice had fallen dramatically during the final decades of the 19th century and an improvement in yields was much needed (Prince 1989).

A special division for the building and improvement of irrigation had already been formed under the liberal policy (Booth 1998:153). The irrigation systems of Java were extended rapidly throughout the first half of the 19th century. These were, however, predominantly privately owned and not very advanced. The new task force set about to improve the irrigation system and, as a consequence, they were improved all across the island (Booth 1998:155). In addition to improving already existing irrigation works new ones were constructed. The irrigation allowed for areas previously unused to be profitable for agricultural activities and, in the first decades of the 20th century, land under irrigation increased rapidly (Booth 1998:153). The new irrigation systems did not only allow new land areas to be used but also multiple crops to be grown every year. While double cropping was an option, it did not happen as there was room for breaking new land and thus keeping up with the population increase until the 1920s. With the constraints on land becoming a reality, an increase in the production and thus keeping up with the population increase could only be achieved through intensification programmes. The role of the irrigation systems should not be overstated. The part of the state budget allocated to irrigation was, nonetheless, extremely small. Furthermore, the new irrigation systems, while opening up new land, were designed primarily for sugar plantation, and were not optimal for any other crops. They were subsequently used for growing sugar and

the village cropping cycles became even more dependent on the demand for sugar (Alexander and Alexander 1978:213-215). The higher the demand, the greater was the risk that rice was to be crowded out. While irrigation may have increased production, it contributed to the labour intensification of food crops such as rice too. But the dominance of sugar made it necessary for the farmers to grow rice in order to survive, and the possibilities for them to grow more lucrative cash crops such as tobacco were limited. This had a number of repercussions for the farmers. Not being able to grow any of the more lucrative crops meant lower incomes for the farmers. But it also meant that there was very little prospect in diversifying. As a consequence of the colonial policy the farmers remained poor and produced crops inefficiently (Alexander and Alexander 1978).

In addition there were other measures, such as the establishment of the Department of Agriculture in 1905, taken in order to improve agricultural production and after a number of bad crops the colonial government took on the responsibility to stabilise prices of commodities such as rice. This led to a takeover of all rice imports in 1918, ensuring an availability of food in the region (Prince 1989:213). The colonial state became responsible for the storage and provision of rice. While the main emphasis was on irrigation, there were also other measures to increase the production. Most of the investments went into the agricultural information services, which was an early version of the extension services concentrating on agricultural research, instruction, training and education of the farmers (Prince 1989:211). These extension institutions promoted the introduction of modern rice varieties as well as more efficient growing techniques and fertilisers. This allowed for an increase in production and the Malthusian trap could be at least postponed, if not avoided. All things considered, however, the sums invested in the agricultural sector were very low (Prince 1989:211). As financial commitment was not strong enough, productivity in the traditional sector remained low throughout the period. As for the net income of the farmers, it was static if not decreasing. There is evidence of rice consumption falling during the ethical policy. The fall in rice consumption, however, was compensated by an increase in the consumption of other food crops and the calorie intake remained more or less the same. As the initial level of consumption was very low it is alarming that it did not increase (Barlow 1985:93). In 1930, a royal commission showed a lack of concern, as it suggested that food requirements in Java should be based on the prison rations in the Netherlands. Even if that was the case, rice production was far too low to provide the entire island with enough food (Higgins 1984:59-60).

2.2.3.1 Extension during the ethical policy

The extension system was formalised in Java by the Dutch in 1910. There had been extension services prior to this as well but they had been focused mainly on the cash-crop sector. The ones working on research in food-crops were not very successful, mainly as a consequence of the economic conditions, which were not very conducive to the growth of food crops. (Eng 1991)

Despite the new agency, little happened in terms of agricultural development, due to the fact that there simply were not enough trained extension officers to serve in the new agency. There were also problems with their training. The focus of their training was on the science of agriculture, and it was believed that if the progress of modern technology was simply made available, it would be used. But as little consideration was given to the actual conditions in the Javanese agricultural sector, the farmers did not take advantage of the new technologies. In the 1920s, though, changes were made in the system. The Dutch began to look at extension as something more than just applying science to the field. agro-economic surveys were carried out in order to map the economic and social conditions in Java. The new extension service targeted successful farmers and introduced new technologies to them. The idea was that these farmers would be good examples and other farmers would follow suit (Eng, 1991:41).

2.3 The Sukarno years (1950-1967)

2.3.1 Prelude to independence

Indonesia was occupied by the Japanese during the Second World War. While the occupation had far reaching political implications, it had little or no effect on the economical sphere of Indonesia (Steinberg 1987; Ricklefs 1993). The Japanese were initially welcomed as saviours and liberators, but it soon became apparent that, as had been the case with the Dutch, they were only interested in exploiting the resources of Indonesia. The new colonial power had other priorities and sugar had to make way for larger rice production. The rice was not meant for the local population but was shipped out of the archipelago to feed the Japanese. No consideration was given to the Javanese farmers' income or whether they had food for the day.

On the 17th of August 1945 Sukarno, the first president of Indonesia, proclaimed the nation independent. Following the declaration of independence, a bloody war lasting four years was fought. This was a time of decline and holds no relevance to this study. Suffice to say, the new republic was free and facing a formidable task to develop a country torn by almost ten years of war.

2.3.2 Independent Indonesia

In 1950 the effects of the agricultural policies of the Dutch colonial powers were fully felt. As a consequence of the First World War and the depression, the plantations had not been maintained and as a result the yields of cash crops were diminishing. As cash crops at this time were the only source for foreign capital, the situation was very serious (Hill 2000:125-126).

The food-crop sector was equally alarming. Food production in Java did increase during the first half of the 20th century, predominantly through extensive methods. The population, on the other hand, had grown alarmingly fast. As a result the rice available per capita declined steadily (Booth 1988:34). There was simply not enough food for the population and the country was forced to import expensive foodstuffs from abroad. The political ideology of Sukarno promoted non-alignment. It was therefore natural at the time to continue the ethical policy principle of promoting rice self-sufficiency, as it would both limit the costly food import and allow for less dependency on the rest of the world (Bresnan 1993).

Consequently, the new Indonesian government set out to increase food production in general and the growing of rice in particular. The rice procurement agency of the Dutch was revived and a goal of self-sufficiency by 1956 was set up. In 1956, however, just under 800000 tons were imported, and the deadline was postponed until 1962, but the imports kept increasing and the Sukarno regime failed once again (Bresnan 1993:115). New attempts were made but to no avail. In an effort to achieve the goals, the president campaigned for people to eat crops other than rice. While this was obviously not working there were also cases of the farmers being forced into cultivation of new high yielding varieties. At the time of the coup attempt in 1965, rice production was no higher than it had been before the war.[7] The population on the other hand had increased rapidly and the situation was dire (Booth 1988:123).

There are many reasons why efforts to increase production failed. First of all, Indonesia suffered greatly from high inflation and, in order to cut costs, civil servants as well as military personnel were paid partly in rice (Bresnan 1993). To be able to afford this, the government maintained low rice prices. In 1964 the price paid by the government was a quarter of the market price at the beginning of the season and only half the price at the end (J.G 1965:60). While the low prices enabled the state to pay its workers, it meant that the returns to the

[7] In 1965 Indonesia was rocked by a coup attempt that eventually led to the demise of Sukarno. The coup is still shrouded in mystery and it remains unclear who were the masterminds behind it. The communists have been given the official blame but no lengthy review will be offered in this thesis.

farmers decreased and the incentive to grow more rice was therefore minimal. Furthermore, the new state needed foreign currency and the emphasis was on the great export earners such as sugar, rubber etc. (Bresnan:1993:115).

Another principal problem was that of irrigation. With the wars the, Dutch engineers maintaining the irrigation system left and there were no skilled Indonesians to replace them at the time, which led to disrepair of the old system. In the first development plan funds were allocated to the improvement of irrigation but the new regime, faced with financial constraints, had to choose between improving the existing irrigation in Java and extending it in other areas of the archipelago (Booth 1977:47). The regime opted for the latter and, as a consequence, the emphasis on irrigation development was outside Java. The first development plan of 1956 allocated a very large proportion of the funds to irrigation, but less than a quarter of the projects were in Java. Furthermore, the plan was never fully realised. The subsequent plan promised improvements but little seems to have happened (Booth 1977:49). As a consequence of this neglect, the irrigation system in Java in the mid-1960s was in worse condition than the pre-war state, and it was not until the 1980s that it became as technologically advanced as before the war. Throughout the Sukarno era the proportion of land that was rain-fed increased (Booth 1988:106).

Chemical fertilisers were also introduced. Before 1957 there were no policies or institutions concerned explicitly with fertiliser production and distribution. The fertilisers reached the farmers through local extension services and private agents. In 1957, Jabatani, a government agency, was set up, to cooperate with private agents in the villages. This first attempt was on a very small scale and had little impact (Kolff 1971:56 ff). In 1959 the Jabatani was replaced by ‘Paddy Centres’ which provided the farmers with heavily subsidised fertiliser on credit. Still, a major problem was that the credits were seldom repaid and the centres had to close down in 1963 (Kolff 1971:58). The role of the Paddy Centres was taken over by PN Pertani which had already replaced Jabatani as the state fertiliser procurement agency in 1961(Kolff 1971:58). With Pertani, the private agents were replaced by village co-operatives and extension services active in the villages. Nonetheless, the system throughout the old order was not very successful. First of all the foreign exchange needed for import often led to shortages, and the distribution of fertiliser worked unsatisfactorily. The stocks of fertiliser never left the harbours and when they did they arrived too late in the season to be used in the rice fields. This was because the agency had to work within a complex bureaucratic system involving the police and military. Finally, since the company was not independent from the state, the government made decisions on prices etc. (Kolff 1971 59, J.G. 1965). It is also

important to bear in mind the fact that the new fertilisers were highly dependent on the irrigation system and, as seen above, this had fallen into disrepair.

Another reason for the decline was the increasingly smaller plots. Booth (1988) has found that there is a clear correlation between the size of the plots and both yields and labour intensification. The process of ever-decreasing land plots was different in different parts of Java, and had begun earlier in the regions that were the most densely populated, but at the time of independence the whole island was suffering. Although the issue had not been addressed under the previous regimes, it became a very important part of Sukarno's political agenda, not so much as a measure to increase production, but rather to battle the inequalities in landownership in Java.

Land reform in Java was a hotly debated issue with landless and near-landless on the one side and the landholders on the other. In the end, the law which was completed in 1960, had two purposes. Firstly, the issue of the large number of landless or near landless. Throughout the Dutch regime the average landholding had decreased steadily (Soemardjan 1962: 26). The second issue was that of sharecropping, which was seen as a great burden on the shoulders of the poorer peasants. Sometimes the farmer was forced to pay the landowner fifty per cent of the crop, but it was often much more than that (Soemardjan 1962: 29). Sharecropping as such was not abolished but absentee landownership was targeted. It was made illegal to own land that the owner himself did not farm, making it impossible to live outside the village and own land (Utrecht 1969:74). Landlords who relinquished their lands were to be given a large sum of money as compensation, which could be used in order to start up some kind of industry. As it was the belief of Sukarno that the large landholders used the land less intensely, a large group of smallholders would increase the cropping ratios and the production. The former landholders, on the other hand, would work well as industrialists and in the end the land reform would lead to a greater prosperity and equal distribution (Utrecht 1969: 72).

The new law guaranteed every farming family a minimum of two hectares of land. The upper limit, however, was dependent on a number of factors. First, the population density. The higher the density, the smaller the land you were entitled to. The second determinant was type of land. Wetlands (*sawah*) allowed for less land than dry land as the yields were greater. If a family owned both dry and wet land, a standard 20 hectares was the upper limit. The last determinant was the size of the household. The standard land allowances were based on a family of seven. With every additional family member an extra ten per cent was

allowed. More than fifty per cent than extra land, however, was not allowed regardless of family size (Utrecht 1969:75-76).
The land reform, which will not be gone through in any great detail here, had very little impact on land distribution in Java. To start with the maximum size of land allowed by the government was far too large. Moreover, in the areas where large landholders were supposed to give up land there was little support from landholders and smallholders alike. There were loyalties in the village, which obstructed the transformation. The issue of land reform will be returned to later in greater detail when distribution is discussed in chapter six.

2.3.2.1 The rise of the intensification programmes
The Intensification programmes will be discussed in greater detail in chapter four, but a small introduction is necessary.

The extension services of the 1950s had little success in increasing production faster than population rates. In the beginning of the 1960s, though, the faculty of agriculture in Bogor tried a new approach. The new system was initially on a very small scale covering only a few villages in West Java (Penny 1965). The institute sent students in their third or fourth year to stay in the villages for the whole rice growing season. Furthermore, the students stayed in only one village. This allowed them to get more acquainted with the farming conditions in that particular village and thus gain a better understanding of what actions needed to be taken to increase production. Another advantage was that, as the farmers got to know the students better, their scepticism about the new technologies faded. The farmers were also divided into groups much smaller than the previous programmes had advocated. In addition to the guidance from the students, the farmers were given access to credit from the farmers' bank as well as from the co-operatives (Roekash, Penny 1967:64). The results in the test villages were very promising as productivity in those particular villages increased dramatically. As a consequence of the success, funding of the Bimas project was taken over by the Ministry of Agriculture in the following year, and the area under Bimas was extended to 220 villages throughout Indonesia but with a focus on Java (Roekash and Penny 1967). In the second year of implementation, students from various universities in Indonesia went to the villages to instruct the farmers. As the services grew, problems arose with the distribution of fertiliser etc. but on the whole the programme was highly successful. It became more institutionalised and had five principles to work by; improved water control, use of new seeds, use of fertilisers and pesticides, better cultivation methods and a stronger co-operative structure in the villages. Problems arose, however, and things were not so good in 1965/66. It probably

had something to do with the coup that failed, but another much more important cause was the fact that the original concept had been changed. The area covered in the Bimas programmes had grown too quickly. The extension officers worked with much larger groups once again and they were not as highly qualified for the job as their predecessors had been (Roekash, Penny 1967:66). Hence, the extension system was far from sufficient at the end of the Sukarno era. Experts in Holland estimated that Indonesia at the time had less than half the number of staff required. Another study by the agricultural institute in Bogor stated that there was an even greater need (Brand 1968:71). Despite these restraints the system had proven more successful than previous ones, and an institutional base had been built for the Bimas which continued after the change of regimes in 1965. The programmes, although on a small scale during the Sukarno period, did have some effects on agricultural productivity.

After the Second World War and the war of independence, returns to land and labour in all agriculture, including food crops, began to increase again. The increase was, however, not enough. After the initial surge, which can be explained by the end of violence, labour productivity did not increase any further. It remained well below the levels before the war, and in fact at the time of the coup that failed in 1965, labour productivity was at a level equal to the situation in 1900. Looking at just the food-crop sector gives an equally gloomy picture. After the wars there was an increase but, as in the case of the whole sector, the late 1950s and the 1960s leading up to the change of regimes was a time of no growth in the productivity of labour. In fact it remained more or less on the same level as it had been in the mid-1930s.

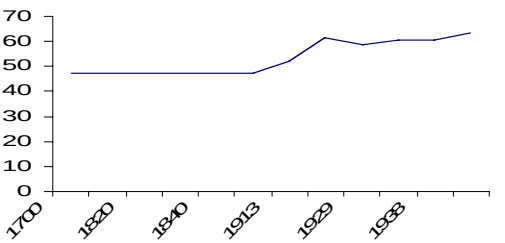
Land productivity suffered greatly from the wars but recovered rather quickly. It increased gradually until the end of the old order. Despite the increase in returns to land, low productivity had an effect on the level of production. In the cash-crop sector, production virtually stopped as a consequence of the war. The increase after the wars was therefore dramatic. After the initial surge, however, it levelled out and the production began to decrease again after the mid-1950s. Rice production increased again in the food-crop sector after the slump due to the war but never got back to pre-war levels. Apart from a small slump in the 1950s, production remained at the same level throughout the decade. It slumped in the sixties and there was no recovery before the end of the old order. As rice was the paramount food crop, most resources went into increasing production with the consequence that other crops were badly affected (Eng 1995:197). This had the effect that food production in

total was not enough to feed the growing population by the end of the Sukarno regime.

2.4 GDP per capita increases

The policies under the Dutch and in the first years of modern Indonesia were thus not directed at improving conditions for the smallholding farmers, but focused on extracting as much resources as possible to the detriment of the indigenous population. This is very much apparent in fig 2 (b). Although production of cash crops increased drastically through out the 1800s, this was not reflected in the income of the local population. It was not until the shift in policy towards a more liberal and ethical policy that there was an impact. Perhaps more alarming, though, is that after this jump in income in the early 20th century, very little happened during the Sukarno regime. This indicates that the indigenous economy could not grow despite the ousting of the very regime that extracted all resources from the economy. Here it will be argued that it is exactly this that was the problem in the Indonesian economy. The agricultural sector was not dynamic and could not catch the new opportunities offered by independence without a strong primus motor.

Figure 2.4 GDP per capita (1928 Guilders) in the indigenous sector



Source: Maddison 1989:35

2.5 Explanations for the development of Javanese agriculture

Writers took a great deal of interest in the development of Java as early as the 19th century. Raffles, the founder of Singapore, expressed great concern for the welfare of the Javanese farmer as long ago as 1815 when he served as governor of the island (Raffles 1965). He was followed by a number of scholars and Dutch civil servants. With them came the interests for the welfare of the peoples in the Dutch Indies, becoming stronger with the liberal sentiment which grew in the Netherlands at the turn of the century. At the time it was generally believed that Java was a dualistic society as well as an economy with two very different spheres. The civil servants explained this as an result of the static society held back by tradition, thus completely disregarding the effects two hundred years of colonial rule may have had on Javanese rural society (Higgins 1984:58). It was from this tradition that Boeke, one of the most influential scholars of Indonesia, came from. According to Boeke, the economy can be divided into two sectors, a modern and a traditional sector, and he firmly believed that the traditional sector is not well equipped to go down the capitalistic path that Europe once had. Doing so would only ruin the social fabric and culture, without accomplishing prosperity and welfare (Higgins 1984). The modern sector is characterised by high productivity of land, labour and capital. This sector is capitalistic and money is used in exchange for goods, labour and services. Decisions are made based on economic rationale. In addition the sector is characterised by a very high degree of division of labour. Finally, the sector is capital intensive and a part of the world market (Boeke 1978). In the Javanese case this sector included industries as well as plantations (Boeke 1978).

The traditional sector is quite the opposite as it is labour-intensive, with little division of labour. In addition this sector has little capital and the sector is built around bartering as goods, labour and services are paid for in kind. Any capital introduced to the sector does not fill any function but is destroyed while ruining the sector. As a result, money is of no use. It is thus useless to invest in the sector. It is bound by old customs, and while the modern industrial sector seeks profit the traditional had only an interest in survival. The individuals of the traditional sector do not act according to economic rationale but rather social considerations. This means that the sector is ripe with resignation and fatalism (Boeke 1978). The sector is dominated by subsistence agriculture and petty trade. This was represented by the rural sector of the economy, in Java.

The bottom line, Boeke argued, is that the two sectors are so different and economic theory as a product of the western world cannot be applied in this context. On the contrary the traditional sector needs protection from the modern

one. To conclude, Boeke applied his theoretical framework on Java, and saw two main reasons for the course of the island's development. Firstly, the traditional sector was stagnant and not equipped for economic prosperity. Secondly, in the clash between modern and traditional, West and East, the sector was damaged by influences from the new economy as it was not apt to deal with modernity. In short the traditional sector was best left alone and there was no hope for it to develop. The theory of dualism, although it was not uncontested, played a crucial role in the academic world in trying to describe the situation in Java under the Dutch.

2.5.2 The power of involution

In the 1950s a group of American researchers took part in a major research project in Central Java. One of these was Clifford Geertz. In a series of books, culminating in the book Agricultural Involution a new view of agricultural development in Indonesia, dating from the times of Raffles until the 1950s, was presented. Although two new concepts were introduced, *agricultural involution* and *shared poverty*, his roots were firmly set in the theory of Boeke, i.e. that the causes of the inadequacy of the agricultural sector were rooted within the sector itself. While Boeke regarded the traditional sector as a hopeless case with internal problems, Geertz saw the colonial system in general, and the cultivation system in particular, as the big problem. The extractive and extremely exploitative policies of the Dutch caused the traditional sector in Java to close up as a protection mechanism (Geertz 1963). The reason for the traditional sector not perishing altogether was the ecological similarities between the two crops, rice and sugar, grown by the farmers and the colonial power respectively, which allowed cultivation in the same areas. The system thus responded rationally to the threat of dropping below subsistence level.

Agricultural involution is the central concept of Geertz' theory. The core of the problem, according to Geertz, was not that the farmers had not reacted to the pressure for change but rather how the sector had responded (Geertz 1963:94-95). The greatest pressure for change had historically come as a result of the rising population. As the population grew, it was absorbed into the agricultural sector. The reasoning was that one more person would increase production enough to feed himself. As the lands in rural Java were extremely fertile, there were no difficulties absorbing the growing labour force. Production, however, remained at the same level, if not declining (Geertz 1963:94-95). Geertz argued that while the agricultural sector in the developed countries responded to

pressure for change by introducing new labour and land-saving technologies, as well as changing or creating a new institutional framework and thereby increased productivity in agriculture in terms of both yield per ha and labourer, the Javanese agricultural sector only changed in order to fortify already existing institutions (Geertz 1963). The whole point of change was to maintain the status quo and not break the relative homogeneity of the village, and as a consequence there was what White refers to as technological hair-splitting and increasingly complex land tenure and labour relations (White 1983:21). It was not evolution where we expect a system to evolve out of the previous one, a continuous process, but rather its opposite, where the system turns in on itself and becomes rigid and stationary. In addition, and as a result of involution and the need to survive there was, according to Geertz, very little stratification in rural Java. Complex social and cultural structures grew so as to regulate the farmers' income and ensure that they all lived at least around subsistence level (Geertz 1963:96). The top priority for the farmers was that the village should live above subsistence level, and it was not seen as proper to accumulate wealth. To conclude, the total effect of agricultural involution was that every labourer received an increasingly smaller portion of the harvest, and the income of the landholder or tenant decreased. This situation of shared poverty is extremely important in Geertz' reasoning, as it led in the end to the traditional sector of rural Java being trapped in poverty with little prospect of breaking free as opportunities to increase income and productivity were few. The people were bound by traditions and low technological levels. This has been termed high level equilibrium where everyone is equally poor, and has been more thoroughly discussed in the case of monsoon China (Elvin 1973). Not only did this lack of stratification of society entail poverty for the masses, but it also prevented the emergence of a small entrepreneurial class which could lead the way towards prosperity (Geertz 1963).

2.5.3 A beautiful hypothesis!

Geertz' view of Java as stagnant and only developing to maintain the status quo was no doubt the most influential explanation for the inability of the agricultural sector of Java to provide its people with sufficient income and food in the 20th century. Brown has stated that it was a brilliant hypothesis, but with no empirical evidence (Brown in White 2002:9). From the late 1960s and early 1970s, the involution paradigm suffered a series of blows and a number of problems in explaining the development of the Javanese agricultural sector. A number of scholars have discredited the theory from various points of view.

Despite this the theory has survived, perhaps more as a result of the usefulness of the concept of involution as a contrast to evolution, than on its merits in the Javanese case (White 1983:20). Although the terminology still remains the same, other scientists have filled it with a new content.
The theory of involution has, however, been studied thoroughly by many and, as White showed already in 1983 (White 1983), there is no need for another Geertz basher and certainly no need for a Geertz revisionist. As a consequence, only a short summary of the critique will suffice.

The criticism has been concerned with both the empirical evidence and the theoretical concept. While the empirical criticism deals with Java, and thus has implications only in the Javanese context, the theoretical shortcomings of the theory have wider repercussions as they affect the whole concept of agricultural involution on an international scale. In this study the latter will only be touched upon as the empirical evidence is damaging enough for Java.

First of all, and this is perhaps the most damaging critique, the seemingly ecological compatibility between rice and sugar is not true. In fact sugar may just as easily be grown in rain-fed areas. In addition, the rotation between sugar and rice, contrary to Geertz' beliefs, has serious consequences for the productivity of rice growing (Alexander and Alexander 1978). It was thus not two systems that coexisted but rather a sugar cane industry which created complete chaos in the traditional farming communities. Elson has shown that areas where the cultivation system was in place, which did not show an increase in labour use and maintained rice production, but actually showed a decline in both (White 1983:23). If the sugar cultivation did not superimpose itself on the village, then it is simply not possible to blame the traditional sector and involution for the stagnation of the sector. This, of course, also leads to questions about the increased complexity or involution of institutions such as labour agreements and tenancy. White argues that the agreements are no more complex than in any other parts of Asia (White 1983:25). While this is no strong argument against involution, there is no evidence of these systems getting more complex. Then again there is no real evidence of the contrary either, but some researchers have found that as early as the turn of the 19th century there was wage labour and most fields were cultivated by the owners (White 1983:24). Although this is uncertain for the past, it is so at the present time, indicating that there are no grounds for this argument (see Sensus Pertanian 1993).

With this serious critique of agricultural involution, the concept of shared poverty as dependent as it is on the first assumption, holds little validity. There are, however, a few issues worth mentioning with regard to *shared poverty*. The meaning of shared poverty is basically a lack of economic or social

stratification. There is simply no evidence of the homogenous structure of rural Java. In fact is quite the opposite with many studies showing the stratification between the landless and landholders, and among landholders as well. It could even be argued that the events of 1965 were a result of stratification and class conflict between the landed and landless (White 2002:12). In addition, Hüsken has shown that it may seem as if the elites change over time, but in reality it is the same families who rule (Hüsken 1984).

Another far more serious issue is the notion that the difficulties in agriculture are inherent to the sector, although the colonial system has fortified them. White (1983) has convincingly showed that the communal land ownership, that supposedly was at the root of the shared poverty idea was brought in by the Dutch in order to serve their needs. This entailed great social differentiation in the villages. As highlighted by Gordon, while Geertz showed no evidence of the communal land proposal, these later writers offered it in abundance (Gordon 1992:506).It thus seems as if Geertz' book was not based on any proper observations, and as a consequence the theory does not hold empirically. This is perhaps not so surprising as his Indonesian studies were centred in a small town he chose to call "Mojokuto".[8] The involution theory was instead based on Dutch reports rather than actual evidence from his own field studies (White 2002). In addition, the study was carried out when Indonesia was very much in upheaval, having just gained independence from the Dutch, and any study will have been biased by this.

While the criticism against the theory from an empirical point of view was detrimental in the case of Java, the lack of evidence does not have an impact on the general theory. Despite being important, these considerations are not of paramount interest to this thesis as it is focused on Java and the empirical fallacies are enough to bring the theory down. There are, however, a number of issues which need greater attention. First of all Geertz sees involution as a society turning inwards and away from the natural evolution of development, but he does not define what evolution is. Without having a clear definition of Geertz' norm of evolution, it is very difficult to know what involution is turning away from (Gordon 1992). The second, big criticism is in the definition of the theory according to Geertz. His ambition was to present a theory of the entire Javanese society. The theory, however, was confined to the agricultural sector and although it, at that time, was the dominant part of the economy, it is too narrow as a definition (Gordon 1992).This may be the case, but the theory has

[8] The name of the town was made up. The small urban centre does exist, but under a different name (Pare).

generally been applied to the agricultural sector. Furthermore, researchers appraising or refuting the theory have focused on agriculture, so it is not a very serious critique.

To conclude, the criticism of involution seems to be overwhelming and it gives us sufficient cause to be wary of Geertz' explanations. Yet, the theory has been incredibly powerful and influential not only in academic circles but also among policy makers in Indonesia where the term *involusi* has often been used as a basis for rural strategies (White 2002). While academia may have discarded the theory long ago, this may not be the case in the corridors of power as policy makers naturally cannot keep up with scholarly debates. In addition, the theory may have had other purposes, making it no more than a brilliant hypothesis (Knight in White 1983:22). This hypothesis later became an alibi for the shortcomings of agricultural policy. We shall return to this in the next chapter.

2.6 Conclusion

To conclude, the agricultural sector in Indonesia played an important role in the economic history of Indonesia in general, and in Java in particular. However, the development of the sector, until late colonial time, was not accomplished in an effort to increase production and productivity to benefit the farmers in the traditional sector of the economy. Instead, it was the colonial plantation sector that was of paramount interest. The result was a highly dynamic plantation sector geared up for the international market and a food-crop sector that could not keep up with the demands of the growing population. After independence there were attempts to revitalise the agricultural sector and to include the traditional sector in the economy, but lack of resources and careful planning led to failure. One reason for this failure was that, despite wanting to develop the sector, this was not done in order to help the rural population as such, but rather to see to the acute food shortages, primarily in the cities, and to feed the growing cadre of civil servants.

At the end of the line, the agricultural heritage that Suharto was given by Sukarno was a stagnating sector which, although given some attention, could neither fulfil its task to feed the population nor provide capital for development.

As far back as colonial times, scientists and policy makers tried to explain the development of the Javanese economy. The early attempts were unable to see the fault of the colonial regime itself, a problem Boeke, the most influential economist on Java in the first half of the 20th century, also failed to rectify

(Higgins 1984). He was followed by Geertz who presented his view on agricultural development through the concepts of agricultural involution and shared poverty. As it turned out these concepts had little, if any, empirical foundation and although influential held little value in explaining the apparent failure of the agricultural sector. Although the theory was not correct, it held enormous esteem within academia as well as among policy makers. As a consequence, it had an impact on agricultural policy throughout the Suharto years and this beautiful hypothesis may be a partial explanation for the development of agriculture under Suharto, although perhaps not in the way that Geertz had envisaged.

Chapter 3

Theoretical Framework

3.1 Introduction

With the shift in regimes in the mid-1960s came a change in development policy. Indonesia embarked on the road towards modernisation and industrialisation. The country moved away from the influence of China and turned towards the successful countries in the northeast of Asia which had adhered to an 'East Asian Model' of development, as discussed in chapter one. This model was founded on the notion of a resilient agricultural sector which could work as an engine of growth in the developing process. For Indonesia, this made sense as the country was not only in dire need of food supplies for the growing population, but stimulating the agricultural sector would also have positive effects on the growth of the rest of the economy (Mellor 1995:1). In addition, Indonesia at the time of the ousting of Sukarno, was one of the least industrialised countries in the world (Hill:2000). An economic policy aimed at improving the majority of the population's lives thus had to start in agriculture. Small technological changes that have an impact on rural production, productivity and income will affect a very large proportion of the population and have profound consequences on the economy as a whole even at low growth rates(World Bank 2007).

It could be argued that Indonesian agriculture under the New Order suffered from the same problems as it has one or two hundred years earlier. From chapter two, however, it should be evident that there had been many attempts to understand Indonesian agricultural development throughout colonial times as well as in the Sukarno years. The most influential explanation was that of agricultural involution. While a beautiful hypothesis, it has proven to be built on shaky foundations and thus gives little insight. Despite falling short, it has been incredibly influential, especially among policy makers. As a consequence, it is impossible to omit it from the discussion, albeit not in the form that Geertz had seen it. As a consequence, the theoretical framework in this study will not attempt to separate the economy into a dualist model like Boeke's. Neither will it resort to cultural explanations like Geertz'. Instead, with a foundation in the 'Asian model of agricultural' development it will seek to understand the process of change in terms of what has been rational for the state as well as peasants. Societies, developed or underdeveloped, will change and respond to changes.

These changes may be due to exogenous factors such as international downturns or a hike in the oil price, but may also be caused through endogenous pressure from within the economy. The focus of this thesis lies on endogenous causes of change. Certain exogenous factors have played an important role in Indonesia, such as the oil shocks in the 1970s. Likewise, the causes of the crisis in Indonesia in 1997 were predominantly exogenous. Resorting to exogenous explanations alone, however, implies that although the economy may be in a shambles it can all be blamed on external factors such as globalisation, thus causing any structural problems within the economy to be overlooked. Most importantly, the aim of this study is not to look at particular events but to determine why the agricultural sector, despite an extensive modernisation process, could not stand on its own legs by the time of the crisis in 1997, in spite of the advancement of the sector in past decades.

Studying the endogenous factors constitutes a long-term historical approach, mapping the dynamics and the driving forces of the transformation process in the agricultural sector. Three theories are used given the research question: what were the driving forces behind the agricultural transformation, and what impact did these have on the modernisation process? First the induced innovation theory, focusing on technological and institutional changes through shifting relative factor prices. Second, the moral economy of the peasant, explaining the behaviour of farmers in less economic terms. Finally, urban bias is used to understand the power relations between rural and urban forces.

Below follows an overview of these principal theories of the thesis in an attempt to show how they can work together despite their individual shortcomings.

3.2 Induced innovation

3.2.1 The origins of the theory

The discussion on induced innovation began in the 1930s when it consisted only of fragments, and it was not until the 1960s that it was fully coherent. Nevertheless, at that time the debate had nothing to do with the developing world but was solely concerned with the effects of new technologies implemented in the industrialised world. There were serious worries that the new labour-saving machines would have an adverse effect on employment in the industrialised countries. As it mostly dealt with industries the principal concern of the theory was the firm. Although focus was not yet on the agricultural sector, the basic idea was the same; the firm, or entrepreneur, will always strive to cut

production costs and will thus try to find a technological solution which can replace labour, land or capital. Hicks argues that, as the cost of a particular factor increases, this will induce a change in technology in order to lower the production costs, increasing profits and productivity (Hicks 1963). In the 1930s with high unemployment this caused a great deal of concern, as higher labour productivity when machines replaced man was not necessarily seen as a good thing. The fear was that higher unemployment would lead to lower consumption and perhaps offset any gains from the increased productivity in the economy, an issue that was highly debated in the interwar years.

3.2.2 Development studies enter the scene

As discussed briefly in the introduction, the key focus of development studies in the 1950s was to industrialise as quickly as possible and the agricultural sector was not seen as an engine of growth in the development process. In the spirit of Boeke, the traditional sector was seen as beyond the scope of development (Boeke 1978). Any capital invested in the sector would give little or no return. Instead, it was the embryonic industrial sector that was perceived as the engine of growth. If labour was moved from the agricultural sector, where it was not needed anyway, productivity would increase in agriculture and industrial production would also grow. In addition, productivity of the whole economy would grow as the least productive sector would become smaller.

In the 1960s, however, the notion of the agricultural sector as not only an important part in the development of the economy, but also as an engine of growth, began to take shape. Rostow, Lewis, Shultz and others outline the role of the agricultural sector as the provider of capital, food and labour to other sectors of the economy and, as the agricultural sector played an important role in the development process, the importance of the growth of the sector was stressed(Rostow 1960; Lewis 1954; Schultz 1964). The sector needed to be dynamic with increased productivity in order to provide other sectors with food, labour, and capital (Kutznets 1966). In addition, it was, as highlighted by Ranis and Fei, equally crucial that the productivity increases did not stop after an initial surge (Ranis and Fei 1961:534). If it did not keep up, the industrialisation process would come to a sudden stop. Productivity increases are therefore essential. It was thus important to study and understand the dynamic process of change and development in the agricultural sector. The adaptation of new technology is often expensive and, as capital is frequently scarce in the developing countries, induced innovation was at the time seen as a way for these

countries to obtain and develop their own technology at a lower cost (Hayami and Ruttan 1985).

With the focus on the developing world, it also became increasingly important for economists to shift their attention to the agricultural sector, as the industrialisation process had often not yet begun. With the shift in focus in the 1960s, the developing world became a part of the induced innovation theory and Hayami and Ruttan constructed the most complete and comprehensive theoretical framework in order to understand the particulars of change in the agricultural sector (Hayami and Ruttan 1985). At about the same time as the agricultural perspective was introduced into the induced innovation framework, great technological advances were made as the green revolution spread across parts of the Third World. The success of the theory was thus twofold since it not only focused on the sector that is most important for initial development in a third world country, but it surfaced at a time when regimes and policy makers needed to justify the enormous resources put into the green revolution.

3.2.3 Technological change in the agricultural sector

In the original theory the two main factors were labour and capital, as the principal concern for Hicks and others at that time was the firm and the factory. In the agricultural context, however, labour and land play a more significant role. As a consequence, the focus of the theory is on these two factors (Hayami and Ruttan 1985:73-76). Although the focus is different, the basic principle of the theory, that the individual will strive to replace the scarce factor through technological change, remained the same. It is important to highlight that it is the relative scarcity which is important. Thus a country may be abundant in land or labour compared to others, but may still need to mechanise before countries less endowed. Anyhow, when land is scarce innovations will push forward the development of land-saving technologies, and when there is a shortage of labour, efforts will be put into increasing the return to labour (Hayami and Ruttan 1985:75).

As with all institutional theory, it is not static as the introduction of new technologies may cause new bottlenecks, making a previously relatively abundant factor increasingly scarce and inducing new technologies to emerge. The building of irrigation systems can increase the yields per ha but will also require more labour in the field. If there is not a readily available workforce at a low cost, some sort of mechanisation is needed to avoid a loss of income for the farmer. Thus, the model describes the innovation process as a very dynamic and

gradual process of constant change based on economic rationale (Hayami and Ruttan 1985:92-93).

The shift may also have the effect that innovations, which were not economical in the past, become very attractive in new conditions. The changes will, naturally, only take place when it is economically viable. In the case of mechanisation, for instance, this will only happen when the implementation costs of machines are lower than the benefits or costs for labour (Hayami and Ruttan1985:77-78). As the theory is not stationary, it helps in understanding not only where a society is at present, but also where it has been and where it is heading.

3.2.4 Two types of technological innovations

As seen above, Hayami and Ruttan's model discusses the two factors; labour and land, and there are two types of innovations which can be induced, the mechanical and the biological/chemical.

The mechanisation of agriculture is somewhat more complicated than a similar process in the industrial sector. The machines in agriculture need to be mobile and are often specialised for each season. A farmer therefore has to use several different machines during the year and, unlike the industrial sector where one labourer is highly specialised in one task in the manufacturing process, the farmer has to be able to carry out several tasks and operate a host of machinery. This means that the mechanisation of agriculture is more capital-intensive than in the industrial sector (Hayami and Ruttan1985:77).

Mechanical innovations are generally labour-saving and the tractor is a typical example in advanced economies, but there are much less sophisticated labour-saving technological processes common in the agricultural sector of a developing world often characterised by a low level of technology. For example, one of the biggest changes in Java came with the replacement of the *ani-ani* knife by the sickle (Booth 1988:182). Harvesting, using the ani-ani, meant that women and children harvested each straw individually. It was time-consuming and required small hands. The introduction of the sickle meant that men, being stronger than women, could harvest more straws of rice in the same time. Although this is a change from one basic tool to another it had a great impact on the number of people needed for harvesting (Steinberg.1987:429).

Mechanical advances need not, however, be only labour-saving; for instance, new irrigation systems enable multiple crops in one year and thus increase the intensity of the land use. Likewise, the irrigation systems allow previously dry low-yielding fields to be more fertile. New irrigation systems do of course entail

the need for more labour in the harvesting process although it may save labour in the irrigation process, so the effect on the labour force is more or less neutral(Booth.1988:178). Nonetheless, the irrigation system is not under scrutiny here and so this particular problem need not be discussed.

While the mechanical improvements are used to substitute man with machine, the biological and chemical innovations increase the yields of the land. The biological or chemical innovations consist of new types of inputs, such as high-yielding varieties and chemical fertilisers. It may also be a change of physical growing conditions by increasing the access to water etc. The biological and chemical innovations play a very important role in the agricultural sector, as the effects are much greater and cheaper than the mechanical innovations. Timmer, for instance, has shown that it was the biological inventions which played the most significant role in the productivity increase in the agricultural transformation of Britain (Timmer 1969:384).

As in the case of mechanical advances, the distinction between labour and land-saving effects is not entirely clear-cut. While most are land-saving and require more labour than before, pesticides save on the workload for the farmers as they cut down on the weeding process. It is therefore evident that, although this categorisation works well, many inventions may have an effect on the use of both land and labour (Booth.1988:178).

3.2.5 Institutions

Perhaps the greatest contribution to the theory of induced innovation is the explanation of institutional change. While many have dwelled on the subject of induced innovation, this is, as mentioned above, an aspect that has often been overlooked. The definition of an institution will not be discussed here in greater detail. It is sufficient to say that Hayami and Ruttan use the definition given by North. It can thus encompass everything from property rights and credit arrangements to sharecropping agreements and agricultural schools (Hayami and Ruttan 1985:95)

The primary cause of institutional change is the introduction of new technology. A new type of technology may create disequilibrium in the economic relations in the agricultural sector. This disequilibrium can only be rectified through institutional change (Hayami and Ruttan 1985:95). For example, there is a new type of handheld tractor that increases labour productivity but the new technology requires proper training or the effect will be less than optimal. The government therefore builds an agriculture schooling system with branches in every village in order to disseminate the knowledge,

and a new institution is created. Furthermore, the machines are expensive and impossible for any single farmer to purchase individually. The farmers therefore form a group and buy it. The group creates a schedule for when any of the farmers get to use it and how much everyone should pay for it.

Institutional change is discussed by Hayami and Ruttan from a demand and supply perspective. The demand side is rather simple (Hayami and Ruttan 1985:97-107). When there is disequilibrium in the economy, there will be a demand from one or several groups in society for changes in the institutional framework in order to return to the equilibrium. The institution is thus treated as a commodity, and it is the cost of the implementation of the change in relation to the benefits that decide whether any changes are demanded. Logically, if the benefits of the change are greater than the disadvantages, then the change will be in demand, otherwise nothing will happen (Hayami and Ruttan 1985:97-107).

Similarly, the availability of institutions is closely related to the costs of implementation. If the cost is right, the demand will create a supply of new institutions and thus increase the supply (Hayami and Ruttan 1985:97-107).

It is important to note that it is not the cost to society as a whole which is of importance, but how it affects interest groups and individuals. The power structure in society is therefore very important. If a change in a particular institution benefits society as a whole, but has an adverse effect on a powerful group or individual, it is highly unlikely that anything will change. Likewise, if there are great gains to a powerful group but not to society in general, institutional change may carry on regardless (Hayami and Ruttan 1985:97-107).

Institutional development is thus a cost-benefit analysis where the effects on the elite will decide what changes take place. The costs will be determined by culture, religion and, of course, ideology. Some cultures will be more willing to change in one direction than others, and this will reduce the costs for that particular implementation. There are also other things that can reduce the costs and thus ease the transition. First of all, education will increase people's understanding and knowledge and facilitate change. If the farmers have attended school, they will have a certain level of ability to absorb and use information to their advantage (Hayami and Ruttan 1985:110).

Secondly, research is very important in order to reduce costs, and advances in social science will make society more aware of the best way to implement a new institutional framework (Hayami and Ruttan 1985:106; 109-110).

In addition, it is worth noting that the introduction of new institutions is generally, just like technological change, a gradual process, which takes place through trial and error. As society learns it will get increasingly efficient in implementing new institutions and thus costs will be reduced.

3.2.6 Some examples of Induced innovation in the agricultural sector

Although it has already been touched upon above, a few examples of how the model works in reality are in order. Two good examples of the model are Japan and the USA. Although the two countries have experienced remarkable growth in agricultural output through productivity increases, growth was achieved by choosing completely different development paths based on resource endowments in the respective countries. At a glance the two countries seem to be the perfect archetypes of the two development paths. On closer inspection, however, it is clear that a certain time after the countries had dealt with the scarcity of one of the factors they would experience a scarcity of the other. This would then cause the two countries, but Japan more so, to change their development paths in order to compensate for the scarcity in another factor. This is also in line with the theory as it includes the dynamics of change with the relative factor prices. Below follows an overview of the case of Japan. Even though the USA is an interesting example of agricultural development, it has little in common with the Indonesian case.

3.2.6.1 Increases in the yield of land

Japan is a very good example of a country suffering from extreme land requirement restrictions and may be said to represent all of the characteristics found in Asian agriculture.

The level of mechanisation was very low in early Japanese agriculture. There had been attempts in the 1860s to mechanise agriculture by using technology borrowed from the west, but the farmers had a minimal interest in using the new machines (Hayami and Ruttan 1985:171,177). Furthermore, the use of animals in production (pulling the plough etc.) was not common practice and it was not until after the Second World War that another attempt to introduce machinery in agriculture was made. It was simply not economical to replace an already abundant factor.

Biological and chemical innovations, on the other hand, had been introduced far earlier and far more successfully. Agricultural infrastructure had already been a priority during the Tokugawa period. Because of this, almost a hundred per cent of the paddy area was under irrigation. As paddy was the most dominant type of cultivation about, sixty percent of agricultural land in Japan at the time of the Meji restoration was under irrigation (Hayami and Kikuchi 1978:842). The ecological conditions in Japan at the time were therefore highly suitable for the chemical and biological innovations, such as new varieties of

seeds and fertilisers, giving higher yields. These fertilisers worked very well with the new varieties, and the yields increased as the cost of the new fertilisers decreased. Due to this, the level of fertiliser use in Japan in the 1880s was already very high. The development block around fertilisers and new types of seeds developed rapidly in the period up to the Second World War.

In the early 1900s more complete extension services were implemented and, as a response to looming starvation in the 1920s, new research facilities were developed to invent hybrid crops. At the turn of the century it had already become evident that there was a limit to how much yields could increase. The scarcity of land meant increasing factor costs, which stimulated the growth of irrigation (Hayami and Kikuchi 1978: 852-588, 864).

Land constraint also created the need for other institutional changes in order to ensure high productivity growth in the agricultural sector, and thereby avoid dependency on imported rice. Initially a law was passed which made it compulsory for farmers and landholders alike to take measures to improve yields if more than two thirds of the landlords wanted this. In addition, the food crisis of the interwar period led to changes which gave the government means to subsidies and land augmentation projects (Hayami and Kikuchi 1978: 849).

After the Second World War, as seen in chapter one, modern Japan began to evolve and new industries required more labour. This caused real wages to increase as labour was siphoned out of the agricultural sector, stimulating the introduction of labour-saving technologies. This process was fuelled by the cheap machinery produced for agriculture, making mechanisation a viable option (Hayami and Kikuchi 1978)

In summary it is evident that after the Meiji restoration in 1868 farmers in Japan responded to the relative factor prices and substituted the scarce factor, whether it was land or labour, with new technology. Furthermore, the technological shifts created an imbalance in the system and institutional changes were necessary.

3.2.7 Critique of induced innovation theory

The theory of induced innovation was a complete break from the old view that technological development was exogenous and, consequently, it has been heavily criticised.

Critics may be found within those endorsing the theory in general, but wish to clarify particular issues within the theoretical framework, and those who do not agree with the theory at all. Those who just criticise the theory, however, do not give an alternative but have just clamped down on it (Koppel 1995:9). As they

do not give an alternative view, the criticism is of little use here. Instead, the focus will be upon those who more or less support the theory but seek to complement and make it more robust. Some, like Burmeister, criticise the theory on country-specific empirical grounds, while others have more general problems with the theory(Brumeister 1995; Burmeister 1987). Although Burmeister focuses on Korea, his critique is highly relevant as the agricultural transformation in Indonesia was also carried out under a totalitarian regime.

3.2.7.1 State led innovation

Burmeister has questioned, in a number of articles on South Korea, whether the innovations in the agricultural sector are induced or not (Burmeister 1987:767). In fact, he goes as far as to suggest that agricultural innovations are directed by the state rather than induced as a response to the demands of the farmers. In order to determine this, it is important to look at the relationship between state and farmers (Burmeister 1987). In the case of South Korea he argues that it was not the farmers' demand for change which set off the technological change in terms of new rice types and fertilisers (Burmeister 1987). On the contrary, although technical improvements were beneficial many farmers did not want to change since, on a national level, not all regions were suited for the introduction of new methods. The reason why it was implemented anyway was that South Korea used a top-down system in agricultural policies at the time of the green revolution. The needs of the state took precedence over the farmer's demands. So, research stations were not a result of the farmers demanding them, but a state-run action devised to promote the state's own goals (Burmeister 1987). Burmeister highlights the vegetable sector as an example of the conflicting interests of state and farmer. The sector became increasingly important to Korean farmers despite the state's policies discriminating against it (Burmeister 1987).

Furthermore, Burmeister shows that, at least in the Korean case, the factor prices which, according to the theory, decide what technological development path is taken were actually set by the state, thus forcing the agricultural sector in the direction strived for by the leadership (Burmeister 1987). Thus, what may be interpreted as the farmers demanding new technology is really nothing more than them responding to the economic conditions manipulated by the state.

Hayami and Ruttan have argued, in response, that the Korean case is not directed innovation but merely an extreme form of induced innovation aided by the state (Hayami Ruttan 1995:170). In a more authoritarian state the government assesses the needs of the farmers and then pushes research and innovations in the right direction. The process is therefore much faster and not

dependent on the farmers' ability to make their needs clear in the market, which, at that time, was a very weak institution. Park argues that the role of the state was just the development of a new institutional framework demanded by the farmers (Hayami and Ruttan 1995). This is what happened in Japan and the Korean case was much the same. This type of induced innovation, however, is very dependent on the leadership of the country (Hayami and Ruttan 1995:170). The explanation is somewhat thin, at least in the Korean case, as there was clearly a demand for an increase in vegetable crops from the farmers. Since the government had many loyalties in the development process, the emphasis on rice production may very well have been a response to the demand of the urban population and not the farmers (Burmeister 1995). This would indicate that the farmers' demand is of little importance in the development of the agricultural sector in an authoritarian state.

This particular critique of induced innovation must be taken into serious consideration in the Indonesian case as the country, much like Korea, was a dictatorship during the most crucial periods of agricultural transformation. Still, this does not render the theory useless, as the concept of innovation includes both the invention and its successful application. The invention comes about as a result of the perceived need for it in the agricultural sector. Furthermore, new inventions will then be dependent on the relative factor prices in the agricultural sector for its success. If there is a need for land-saving technology the invention may be a success. The new invention, however, may cause factor prices to alter in its favour and thus make it more interesting to the farmers. There are certain exogenous elements in this process, but then again these are impossible to rule out completely. It could, of course, also be argued that the agricultural sector is just one small part of the economy. The needs of the state, representing several different interests, operate within a larger economic context. The tampering with prices or the coercion of farmers to grow a particular crop is only the result of endogenous pressure from within the system. Change, although coming from the top, is induced by the needs of the whole economy. The state merely responds to the greater need.

3.2.7.2. The need for a less general view

Another issue for which the theory has been criticised is how agriculture has been generalised; treating the farmers as a homogenous group (Gabrowski 1995:77-79). A closer look at the rural sector in most countries gives a picture just as stratified as any other sector of the economy. In the agricultural sector there may be several different groups divided according to landholding size and ecological conditions, to name two criteria. The demand for technological

change may not reflect the needs of the entire sector but only those of a select few (Gabrowski 1995:81). This means that there will automatically be a bias towards those already benefiting from the current technological paradigm, and the most influential groups will the more affluent ones in society. The demand for technologies will thus be dependent on what has previously been implemented. This will be even more the case as the richer farmers get richer and have the option to alter the institutional framework including credit systems etc in order to satisfy their needs.

In addition, the theory is equally indifferent to the regional disparities. From the USA there is evidence that data from different parts of the country does not offer satisfying empirical support for the theory. In some cases the theory is even contradicted by the data. This presents the problem of a theory initially devised to be used on a micro level but has then been aggregated to a much higher level (Olmstead and Rhode 1993). The theory can thus not be applied to a large country or a country with diverse ecological characteristics. In the Indonesian case this would be a problem if the aim of the analysis was the whole country. As the focus area in this particular study has been limited to Java, with a similar culture and ecology, this problem has been avoided.

Furthermore, it has been argued that the agricultural sector is a far too aggregated level of analysis (Hayami Ruttan 1995:174-1775). This critique is, however, not focused on the different groups of farmers, but on the unification of the farmers and manufacturers in the analysis. This puts rice farmers and fertiliser manufacturers under the same looking glass. Hayami and Ruttan, on the other hand, argue that the sectors are intertwined, referring to the definition of innovation above, and that, for example, a new type of fertiliser is highly dependent on the farmers adopting it (Hayami Ruttan 1995:174-175).

The problem of looking at the sector at a too aggregated level is, however, dealt with in the theory. It is clearly stated that there are different groups in agrarian society and the path of development is dependent on the more powerful groups' preferences. In the Indonesian case it is highly interesting to look at these interest groups, and this may perhaps explain why some areas have been very well developed while others have not. It also helps in understanding the patterns of technological change.

3.2.7.3 Institutional innovation

The theory has not only been criticised for the analysis of technological innovation but also for the induced institutional aspects. First of all, there are difficulties in assessing the costs and benefits of new institutions. As seen above, the innovation of new institutions is dependent on both supply and demand

factors. In some situations, however, it is very hard to distinguish between who is a supplier and who demands the new institution. For example, in a landlord/tenant situation if a new system for deciding rents is implemented, it is difficult to ascertain who demands and who supplies the institution. With this uncertainty it is also unclear who benefits and who does not, and it is very hard to determine the transaction costs.

Finally, many critics argue that the definition of an institution is too general and thereby makes the theory weak. If a definition of such a core aspect of the theory is as vague as it is in Hayami and Ruttan's case, all institutions will have to be taken into account. As a consequence, an institution may encompass everything from a legal framework on a national level to the very local trade arrangements between two individuals in a village. This may not seem a very big issue but, in relation to the discussion above on state-led versus induced innovation, it is of great importance. In fact, it may help to understand why Burmeister sees a need to introduce the concept of state-led innovation in the case of Korea. It may well be that larger macro institutions, which are present throughout a country, are state-operated and thus push the farmers in a certain direction. On the micro level, however, smaller institutions, which may or may not be connected to other parts of the economy, form locally as a response to the individual's needs. If this is the case, it is easy to understand how research stations, credit schemes and agricultural schools have developed on the initiative of the state, while sharecropping agreements and informal credits systems have developed as a response to the farmers' own needs.

3.3 'Safety first' vs. 'induced innovation'

Induced innovation assumes that the number one priority of an individual is to maximise profits. For a farmer this means that he will gradually replace the scarce factor in order to increase production at lower costs and thereby steadily increase income. The farmers in Java, however, often cultivate very small plots and these are barely enough to meet the needs of the farmers, let alone to sell their produce in the market. It is thus not written in stone that the main assumption of the induced innovation theory is the only important factor in the decision making process. This means that the theory cannot explain agricultural development unless it is based solely on economic rationale, and is therefore of little help when the farmers do not react as is expected of them from a neo-classical point of view.

The farmers in the developing world have been compared to a man standing in water up to his nose, barely able to breath and least of all prepared to do anything that would mean drowning (Scott 1976). To these farmers, it is not necessarily the promise of greater income that governs their everyday decisions, affecting their choices in modes of production, to the extent that they may seem to prefer older and antiquated technology and cultivation procedures. For the same reason farmers may purchase land although it is extremely expensive and not economically sound, and they will work extremely hard, exploiting themselves, at ever diminishing marginal returns just to eke out that last bit of income from the fields. It is perhaps not economically viable but as long as the farmer's ability to feed his family is not impaired, he will not trade profit for risk. This reasoning can be found in most subsistence-based agricultural communities in the world and this is what has happened in parts of China and Vietnam.

One way of understanding why farmers may have considerations other than the economically rational can be found in the theoretical concept of moral economy. Moral economy was first discussed by Karl Polanyi when studying poor people in the pre-market era (Scott 1976: 5,9). The term was later used by Thompson when analysing food riots in England in the 18th century. At this point the theory was, just like induced innovation, only interested in issues closer to home, i.e. it was used to explain the uprisings which had occurred in Europe during the modernisation process in primarily the 18th century (Scott 1976:5). It was not until the late 1970s that James Scott shifted focus in the debate to also include third world farming communities. In doing so he moved the debate into a more modern context and it became a crucial part of the development debate. As in the European case, the theory is generally used in describing the causes of violence, which occurs in the modernisation process, and the introduction of markets. This study is, however, not interested in explaining violence, but the driving and hampering factors of the agricultural transformation, and as a consequence it suffices to utilise the parts of the theory that help in understanding the application of modern technology. Consequently, the theory helps to exam why Javanese farmers endorsed certain types of technology but rejected others.

3.3.1 The effects of near subsistence farming on modernisation of agriculture

The theory of moral economy of the peasant was a response to the often held view of farmers being slow and backward and not embracing change. Scott does concede that farmers are not all that keen on change, but seeks to explain this by not just dismissing them as irrational and conservative.

Instead, farmers have other sets of priorities which include some not purely economic. This derives from the fact that subsistence farmers are, unlike a capitalist, not just producers but also consumers. Every decision has to be taken on the basis that if something goes wrong, it does not just have economic effects but will jeopardize the family's food supply and thus ability to survive (Scott 1976:13).

In addition, rural life is often ruled and dominated by cultural and social networks, which require the family to contribute resources for ceremonial and social functions. This helps to minimise risk for the village, but at the same time it results in additional costs for the family, which, if not paid, can have an effect on the farmer's social standing in the village.[9] Losing income thus has implications beyond the economic sphere (Scott 1976:9).

Adding this dimension to the analysis of farmers' economic behaviour shows that, by failing to see the economic rationale of modern technologies and practices they are not conservative, but that they live by the safety before profit philosophy.

This 'safety first' principle makes sense when looking at the introduction of new high yielding varieties, chemical fertilisers etc. The new, modern inputs increase yields dramatically from the first season used, but the risk involved is also significantly higher. This means that the overall production over a longer time period will be substantially higher for the modern varieties, but every so often a pest, vermin or some other calamity will strike causing the harvest to drop below the subsistence level, and result not only in starvation but also in social embarrassment (Scott 1976:9, 16). Another issue in Scott's simulation is that a farmer has to wait for about five years before the really big harvest comes. This would, of course, be impossible to a subsistence farmer, as he would have to sell off land during that time, or perhaps get himself increasingly into debt, in order to stay afloat (Scott 1976:19). This is not to say that bad harvests do not affect the farmer using traditional varieties, but it is generally much more seldom. It therefore makes sense for the farmer to grow the lower yielding but

[9] Failing harvests due to drought, vermin etc. while common in Asia, often only affect a few of the farmers in a village.

safer crops. Furthermore, the cost of modern varieties and inputs is much higher than that of the traditional. Losing a harvest thus means a great deal more in terms of financial loss. In addition, before making a decision as to what inputs to use, the farmer will look back at previous years of cultivation with the traditional varieties and feel a sense of security which comes with familiarity. The new varieties on the other hand do not have this advantage and thus create even more uncertainty (Scott 1976).This fear of failure and insecurity would also lead to farmers losing interest in growing cash crops. These are avoided by the subsistence farmer for several reasons. First, there is a great deal more risk involved in growing these crops and the farmer cannot afford to lose out. Second, the crops, though giving a higher return, cannot be eaten and as a consequence the farmer is dependent on the crop fetching a good price in the market in order to feed the family. The farmer thus adds market slump to the already risky equation (Scott 1976:20-21).

Although Scott sees the farmers as risk averting, this does not mean that the theory sees the farmer as static and one who avoids new technologies at any cost. On the contrary, if there is consistent proof of modern agricultural practices and technologies increasing production without heightened risks, the farmers living close to the minimum level of subsistence will also eagerly adopt these(Scott 1976::24). This in turn also means that as the farmers are afraid of risk, not change, they will do anything to stay alive and adopt new methods or introduce cash crops when they find themselves in a situation where old ways prove increasingly difficult due to changing conditions. Farmers are thus not adversely disposed to modernity only to risk (Scott 1976:26). This is further exemplified by the fact that subsistence farmers also attempt to diversify their crops, thus growing a portion of their fields with the safe option, and then growing something else a bit more risky, and probably more profitable, in the rest of the fields. While doing this they never infringe on the areas under subsistence crops, as those are crucial to the farmers (Scott 1976:26).

In order to minimise risk, the farmers can find help in the social network around them. The social networks, however, always imply, albeit tacitly, a reciprocal factor meaning that farmers will have to pay back at a later time when his fellow farmers need him. This may prove to be very difficult as there is no reason why the farmer’s situation will improve any time soon and it will be equally difficult to return the favour a few months later. Help could also come from the state. The state will provide additional income, subsidies etc., but this is also a difficult one as it often requests something in return such as labour or taxes, which the farmer does not like (Scott 1976:32). Perhaps this is exactly

what is needed: a state that has the development of the agricultural sector as one of its main goals should use this opportunity to relieve the farmers of some of that risk, be it through subsidies or lender of last resort or even in battling pests. In addition, the state may help to get the farmers over on their side by displays and demonstrations which will assure the farmers that the new modern varieties are not particularly high risk, if cultivated correctly.

3.3.2 The distributional effect of a moral economy

As seen above, although the theory of induced innovation briefly discusses the role of equity in the development process, it does not contribute to the theoretical understanding of the issue. Instead, it offers other explanations outside the scope of the theory. The theory of moral economy, on the other hand, does offer help in this direction. The safety first principle does not only have implications in terms of near-subsistence farmers not being interested in maximising their profit, but also when discussing the income gap in rural areas. The new technology will not be adopted very fast in areas where all farmers are living close to subsistence level. In many areas, however, there are farmers of different economic standing and different economic reasoning (Scott 1976). This means that the closeness to the subsistence line will determine how prepared a farmer is to adopt the new technology (Scott 1976:22). The farther from the line the more willing and capable he is to use modern agricultural inputs and practices. The slightly more affluent farmers will be able to cope with the occasional bad harvest (Scott 1976:22). As these farmers can invest in somewhat riskier ventures, and reap the benefits of new technology, they will gradually be able to afford the modern technology and to increase their risk-taking. In the long run, this will lead to widening income disparities as the farmers close to the subsistence line will not be able to follow the others. Scott argues that most farmers in Southeast Asia belong to this group of near subsistence farmers (Scott 1976). Even if that is the case, there is still stratification within the sector and this can be explained with the help of closeness to minimum subsistence. As a result, if there are no programmes aimed at the poor, large inequalities may grow within an area as modernisation gains momentum among the more affluent. The state may thus play an important role in balancing this development.

3.3.3 But the farmers are rational!

The theory of moral economy has not stood unchallenged. There are three main lines of criticism. Although separate they are closely related. It is argued that Scott in his analysis fails to realize the economic influences on institutions other than the market. North and others (Arnold 2001) argue that there are strong economic influences on the family, the government etc., and while these may be non-market they are not necessarily non-economic but rather formed in order to lower transaction costs (Arnold 2001:87). There are thus economic considerations in the forming of these institutions and the individuals do act out of economic rationality. While this critique is more concerned about the moral bit of the economy and institutions in society, there are also those who go deeper into the economic side of Scott's reasoning. The biggest and perhaps most relevant criticism in the context of the present study is that it all boils down to simple economic considerations. Behind social norms and the reciprocities that make the farmers refuse certain types of technology, there is nothing but economic considerations based on self interest. The most well known advocate of this argument is Popkin (Popkin 1979:19), who finds that behind the social norms and the moral context there is unifying investment logic, which really makes these peasants income-oriented and materialistic just like everyone else, and that they are just as rational and maximising as the rest of us(Popkin 1979:19). Even the farmers who live close to subsistence level will strive for something better. Popkin feels that even the smallest increase in production may be used to gamble on a better future. They will therefore not only, as Scott argues, want to protect their meagre livelihood at any cost, but also try to raise it through long- and short-term investments. This means that the farmers are not as risk-averse as the theory of moral economy assumes, and that they will be subject to crises not only in the short run but also in the longer time perspective (Popkin 1979:19). It may thus be a risky business to have a child in the short run but, in the longer perspective, being childless means a greater risk when one is old. It is thus an investment to have a child, which will pay off eventually. In order to avoid the crisis in the long run it is thus important to invest in tools, land etc and thereby accumulate capital in the short run. Furthermore, Popkin argues that even farmers very close to the subsistence level will take risks rather than save the little money they have, in the hope of moving up one or more steps of the social ladder (Popkin 1979: 25).

In addition to these bigger problems there are of course other issues that need to be addressed. First, what constitutes the subsistence level? There is evidence in the work of both Scott and Popkin that this level will differ between

regions or nations. Scott argues, logically, that there is a physiological subsistence level which, if crossed, will lead to starvation. This is perhaps the only valid definition. However, according to Scott, a Javanese farmer can get by on less than his Thai counterparts (Scott 1976:19).

Popkin also argues that in a long-term perspective like that taken by Scott, it is difficult to asses which farmer is better off, the one who has one good and one bad harvest or the one that has two harvests just above subsistence level. This argument is convincingly dealt with by Scott as he shows that the average income can still mean that the income of the individual from time to time dips below the subsistence level and causes starvation (Scott 1976:10).

Whichever argument is used, it is safe to say that despite these conflicting views, both sides in the dispute agree that the farmer is acting rationally but from different points of view. Farmers across the world act rationally and this is also the case in Indonesia. It is perhaps the basis for the rationale that may differ. The big difference between the two is highlighted in the second part of their argument about social cohesion and the reason for acting in a more political sense.

3.4 Urban Bias and Agricultural Innovation

One way to understand disparities between the rural and urban economy was presented by Lipton in the late 1960s. He built on a long tradition of putting agriculture and the experiences of the 'East Asian Model' in focus (Corbridge, Jones:8). It is not so much a theory as a hypothesis seeking to explain a widening gap between rural and urban areas (Corbridge; Jones:2).

He argued that the big conflict in society was no longer between classes or between capital and labour, but between rural and urban areas (Lipton 1977:13). The number of poor people in the world had not decreased despite economic growth. At the same time the overwhelming majority of the world's poor lived in rural areas (Lipton 1977:27-28), indicating that although there had been economic development, it did not reach the rural poor but rather remained in the modern city centres. The theory, formulated at a time when there was economic growth in most of the Third World, was an attempt to explain why some were poor and others not. When growth ceased altogether in many countries in the 1980s and 1990s, this theory was used to explain the phenomenon, stressing the need for a dynamic rural sector (Karshenas 2004:171).

Lipton's main argument is that although the world has seen great improvements in economic development since the end of the Second World

War, the decision making in development policy in the Third World has been biased towards urban development (Lipton 1977:13). This may not always be a conscious decision from the rulers, but they are often in the hands of urban groups such as labour unions, student organisations etc, all with predominantly urban interests(Lipton 1977: 46). In addition, the interest groups in the rural areas are often weak and cannot make themselves heard in the urban context. When these groups influence policy, resource allocation gets skewed away from the rural sector (Lipton 1977). A most obvious way of doing this is to tax the rural population heavily in order to subsidise the urban sector (Corbridge; Jones:11). Another effect of the urban-bias policy is to suppress food prices in order to ensure a cheap food supply in the cities. However, deflated prices have an adverse effect on the farmers (Lipton 1977:288 ff). Furthermore, the urban elites often ignore policies, such as land reform, which largely affect the poor to a great extent (Lipton 1977). A land reform may increase the utilisation of land and the productivity of labour, and at the same time increase the income of many of the rural poor. The urban needs are often best met by the rural elites and so, in order to maintain favourable conditions in the cities, urban interests will ally themselves with the bigger landholder in rural areas and unequal landholdings will prevail (Lipton 1977).

The result is a vigorous urban economy and an agricultural sector that, although perhaps not stagnant, remains inefficient and unequal. In addition, resources that seemingly only have implications for the rural sector, such as fertilisers, may be distributed with an urban bias (Lipton 1977). True, the use of fertilisers is very limited in urban areas, but that does not stop a policy to allocate this particular input in a manner that will ultimately benefit the urban sector, while completely disregarding the effects this may have on the rural population in terms of efficiency and equity. Fertilisers will be distributed to those farmers who grow for the market, or grow a particular crop, completely disregarding the other farmers as they play no important role in production of the foodstuffs needed to feed the urban population. The result is a more unequal rural sector, implying that an urban bias creates a gap not only between urban and rural sectors but also within the agricultural sector. This suggests that although Indonesia has had a very large development budget for rural Java, it may not necessarily have been directed only towards improving rural conditions, but also have served as a means to provide for and improve conditions in the urban sector.

3.4.6 Critique of the Urban Bias approach

Despite building on the growing consensus that agriculture was the source for economic development in any struggling Third World Country Lipton, was also criticised. It is argued that the urban bias hypothesis is too much of a generalisation. Several researchers have argued that Lipton forgets the urban poor in the equation (Lipton 1977:12). If they are included, it is not so clear that urban bias serves to maintain a situation which does not benefit the poor. Lipton quite rightly argues that the majority of poor people are situated in rural areas (Lipton 1984). There is evidence showing that the policies, which do not benefit the rural poor, have little effect on poverty-stricken urban areas. This highlights a much more important issue connected to the argument of a too general classification of city dwellers and rural populations as discussed above in relation to induced innovation. It is perhaps, as argued by Griffin (Griffin as cited in Corbridge; Jones), not a case of urban versus rural but city capitalist and large landholders against the landless, smallholders and urban citizens in the informal sector, making it a class rather than a sectorial struggle. In the context of this study it is of less importance whether it is a matter of class relations or conflicting interests. As seen above, Lipton maintains that it is the elites that drive development in a particular direction. These elites, largely found in the urban sector, influence economic policy and strategy. As a consequence, bearing in mind that both urban and rural areas are much less homogenous than Lipton perhaps believed, the concept of urban bias fits well into the frame of analysis.

3.5 Concluding discussion, state led involution?

The aim of this thesis is to understand why the agricultural sector in Indonesia was not ready to stand on its own legs at the time of the crisis in 1997. According to the ‘East Asian Model’ of development, the sector should be resilient and work as an engine of growth for the rest of the economy as in the ‘East Asian Model’ of development’. When analysing the development of the sector, the principal theory used is the theory of induced innovation as conceived by Hayami and Ruttan. The theory is appropriate for understanding why and when technological and institutional change occurs. It helps understand why and when certain technologies and institutions are implemented or discarded. At the core of the theory lie the relative factor prices and these determine whether a country moves towards labour- or land-saving technologies. In the case of Java, this would entail, in the initial stage, a policy focusing on land-replacing technologies as land is scarce and labour is abundant.

Despite its merits, the theory needs to be modified slightly in order to grasp the complexity of Indonesian society for this study. The reason for this is that it assumes that the farmers can operate as free agents choosing to adopt new technology whenever these are available. In Indonesia, much like in Korea as described by Burmeister, the state plays a very dominating role in the choice of technology and the building of an institutional framework. It could be argued that this state-led innovation process is induced, as the state is a part of the economy, and this may be the case. This thesis, however, argues that as a result of vaguely defined institutions there is both induced and state-led innovation in an authoritarian regime. Though separate, it is, of course, inevitable that these two paths of change influence each other. Change is thus brought on by either the farmers themselves locally, depending on the factor prices of land and labour, or by the state. The theory, nonetheless, only takes economic factors into consideration and consequently may fall short of giving a full explanation for Javanese development. As there are two sets of actors, the state and the farmers, their motives need to be examined more carefully and the analysis needs to be two-fold. First, when studying state-led innovation, the real priorities of the state need to be assessed. Indonesia under Suharto was a totalitarian regime and had motives other than just economic. In this case the role of urban bias is being discussed from the point of view that it is urban interests that lie behind the state innovations causing the agricultural sector to be seen as only a resource base for the urban economy and industrialisation. This means that the best interest of the rural economy may not be considered.

When discussing change from the farmers' point of view this is done not only with the help of induced innovation but also with Scott's theory of moral economy, giving a more just view of the rationale that lies behind change in rural Java, where the farmers often strive for safety rather than wealth. The theory of moral economy shows that farmers may value safety more than profit, and, if there is no help in the transformation process, they may very well function as an obstacle in the process. This makes the role of the state as a driving force even more crucial and any policies influenced by urban bias will have far more serious implications.

Furthermore, equity plays a crucial role in the 'East Asian Model' of development'. This can also be addressed within the theoretical framework described above. While induced innovation theory misses the target by failing to see that there is likely to be a strong bias towards the more affluent in society, both Lipton and Scott include this in their analysis. Lipton sees the urban bias as a means for the urban elites to gain power and create greater income differences

between rural and urban areas. Furthermore, this means that the elites in urban and rural areas join forces in order for the cities and industries to get as much out of the system as possible. This means that Indonesia, as highlighted by Timmer (2004), despite having emphasised agriculture, has, at times, further aggravated distribution in rural Java in its attempt to see to the needs of the urban population. State-led innovation and urban bias may thus lead to greater differences between rural and urban areas, perhaps under the veil of involution.

Moreover, Scott can help in understanding the problems of inequity found in any modernisation process. The moral economy or safety first reasoning is stronger the closer a farmer is to the subsistence line. This means that the groups in society which are closest to starvation or social embarrassment will also be the most reluctant to try new technologies since they, relatively speaking, stand to lose much more than the more affluent. In addition, the input costs are often so high that it is difficult for them to adopt new technologies since they have little or no savings. The well-off therefore gradually move ahead in the modernisation process and reap the benefits and income gaps widen. The state may here play an important role as it can help by supporting the poor as well as to minimise risks.

To conclude, a framework of three theories has been created to help understand the driving force of agricultural transformation in Indonesia. The three core issues of the 'East Asian Model' of development; productivity, income and equity are all influenced by the actions of the state as well as the farmers. Historically, the rural sector of Java has been seen as stagnating and involuted. Several studies have, however, showed that this was not the case. Despite this, the view has been extremely influential among academics, policy makers and the urban elite i.e. the very people who, in the state-led innovation process, make the decisions as to what changes in the rural sector should be made. In this thesis it will be argued that involution is truly dead in the form Geertz envisaged. If it does live on it will only be an idea from the past that serves as an alibi for urban bias, serving the needs of the elite. It is not only a case of state-led innovation but also one of 'state led involution'. The state may have worked as the primus motor for change in Java but primarily in order to serve its own and the urban interests. This way the state may have also worked as an obstacle to further development once its primary goals were achieved. In its efforts to please the urban elites some of the characteristics of agricultural innovation, such as food production being increased at the expense of labour productivity and stagnating income for the rural population, may have been replicated. Although there may have been farmers wanting to change, they could not since the state was pressing forward in its own technological paradigm. As a

consequence of this policy, the farmers who wanted to and could press for change were few in number. The end result was that the sector was not resilient and ready to stand on its own at the advent of the crisis in 1997. Let us turn to these three areas in the next few chapters.

Chapter 4

Productivity in Javanese Agriculture Under Suharto

4.1 Introduction

The 'Asian model of development', which functions as the guide for this thesis, contains three criteria crucial in the modernisation process. The first of these decisive factors is productivity. The aim of this chapter is therefore to examine more closely how production and productivity growth developed during the Suharto regime. However, accounting for the development in the sector is not enough. In order to understand why Indonesian development has taken a certain path it is equally, if not more, important to look at the driving forces behind the progress in the agricultural sector as well as their motives. In doing so it will be possible to better understand the nature of Javanese agriculture and offer a partial explanation as to why the economy tumbled in the wake of the economic crisis in 1997.

As discussed in chapter three, production can be increased simply by extending the land under cultivation or by increasing the labour force or both. This is a gradual process with a growing population and the extension of a cultivation frontier. Increasing production in this manner, however, has its limitations as land eventually becomes scarce and the increase in the use of labour leads to diminishing returns per worker. This will, at best, lead to a stagnating sector, struggling to produce a surplus to be transferred to other sectors of the economy, thus hampering economic development. The worst case scenario is a sector no longer able to sustain the growing needs of the ever-growing population, with crisis and starvation as the result.

Without fail, extensive growth in agriculture eventually comes to an end. As a consequence there will be a need to increase the productivity of land and labour. Increasing the productivity of land is generally attained when the land frontier is closed, while labour-replacing strategies are employed when there is a scarcity of labour or when a country is striving towards development by creating a surplus of food, labour and capital, which can be transferred to other sectors of

the economy. Hayami and Ruttan's theory of induced innovation in agriculture provides a model which explains which path is chosen, depending on the relative abundance of labour and land (Hayami and Ruttan 1985). As Java at the time of the ousting of Sukarno was abundant in labour and scarce in land, the theory proposes that innovations augmenting land use should take place. This makes sense in the initial stage of the development process as the state needs to increase production quickly while not jeopardising the capabilities of the agricultural sector to absorb labour. In this situation it is also rational to the farmer as, due to increasingly small plots of land, he has to increase yields in order to survive. The interests of the two, at least partially, coincide. In a second phase, however, when labour replacing technologies gain headway, it is not such a clear-cut case. In the present study this was even more apparent in Yogyakarta as labour productivity increased less than the rest of Java. This meant that there were mechanisms at play, other than the economic rationale assumed in the induced innovation theory. It will be argued that the farmers, on the one hand, were risk averse and, as a result, unable and unwilling to risk their safety. This caused the state to become the principal actor and, as a consequence, the policy of the Suharto regime towards agricultural transformation needs to be more carefully examined.

The discussion focuses on Yogyakarta but also gives an overview of the development of Java. The chapter is structured chronologically and thematically discusses land and labour productivity. It starts, however, with an overview of the agricultural extension system in Yogyakarta under the Suharto era. Besides being relevant to this chapter, it also offers a good backdrop to the next two chapters as these agencies had a profound impact on most aspects of rural life.

4.1.2 The agencies concerned with agricultural development

Very little has been written on the Indonesian extension system. Apart from two dissertations by Hussain and Mundy, there are few sources of information. The following section draws heavily on the work of Mundy.

The development of the agricultural sector was principally entrusted to the Ministry of Agriculture, which worked through a number of agencies in the regions, the most important one being Dinas Pertanian (Mundy 1992:30). The organisation was highly centralised and each region had a number of Dinas offices, each responsible for a particular type of agriculture such as livestock, fishery and food crops (Mundy 1992:28). Although all branches were active in Yogyakarta, we focus on those concerned with food crops. This choice has been made as cultivation of food crops was the most dominant agricultural activity. In

addition, the officers worked closely together and thus had a good overview of the development of the area.

The provincial Dinas answered to the provincial coordination offices *Kanwil*, which in turn acted on orders from the Ministry of Agriculture in Jakarta. Despite the close connection to Jakarta, they were administratively under the local governor. Below the provincial level there were district offices. These also answered to Jakarta but were at the same time under the jurisdiction of the local district head. This allowed the regime to tie the agencies closer to the central authority, ensuring agricultural policy was carried out according to its plans, but at the same time this order would have increased the risk of conflicts between regional and national policy makers (Mundy 1992:29-30). At the sub-district level, in the kecamatan, there were rural extension centres, *Balai Pertanian Lapangan* (BPP) responsible for teaching and guiding the farmers. These centres ensured that information on new technologies was spread to the farmers. The staff at the centres were referred to as *Penyuluh Pertanian Lapangan*, field training officers (PPL). The officers divided the villages in the kecamatan among themselves. Each officer had to visit the villages once or twice a month to instruct, help and gather information on how the new technologies and techniques work (Dinas 1973; Penny 1968). In addition to distributing information and know-how, the officers were to report upwards on issues such as pest control etc. in order to make these procedures more efficient.

Dinas Pertanian has been active in Yogyakarta from the start of the Suharto regime (Dinas 1967). It started out as a small, makeshift organisation, with only a couple of staff but gradually grew larger as resources increased (Dinas 1968-1998). It is evident from the farmers' testimony that Dinas Pertanian and PPL, in cooperation with the state-owned radio and some journals, eventually became the paramount knowledge resource for the farmers, with a monopoly on information.

In addition to the extension system there was the so-called mass guidance, Bimas, programmes, which, as seen in chapter two, were introduced under the Sukarno regime as early as the 1960s. Bimas was not an independent extension system but rather a programme directly targeted at increasing the productivity of chosen crops through mass guidance.[10] Just like Dinas, Bimas operated on a number of levels. As expected, the programmes were closely connected to Dinas as Kanwil was responsible for the running of it although the provincial governor was officially in command. This sharing of responsibility is mirrored on lower

[10] Bimas is an acronym meaning Bimbingan Massa, or mass guidance. Bimas was originally a hero from the Indian epic, Ramayana

levels of the administration and reflects the somewhat ambiguous power-sharing agreements discussed with regard to Dinas Pertanian above (Mundy 1992:27).

The Bimas programmes worked on five principles; improved water control, use of new seeds, use of fertilisers and pesticides, better cultivation methods and, finally, a stronger co-operative structure in the villages (Lokollo 2002:3). The Bimas programmes were improved in 1970 by the addition of *wilayah unit desa*, or village units. These units consisted of a field extension worker, a village bank which would provide the farmers with credits and a village unit cooperative which, among other things, dealt with the distribution of inputs and marketing of rice. There were also the village kiosks, often privately run, selling inputs directly to the farmers (Lokollo 2002:4). Alongside Bimas, there were the Inmas programmes. The two programmes worked similarly and the farmers were given a package consisting of seeds, fertilisers and pesticides. The Inmum programmes, however, did not call for any joint operations with others (UNDP 2001:81).

At the beginning, the Bimas provided guidance for rice but gradually, and on a much smaller scale, other crops, such as maize, were introduced. In the initial years of the New Order, production increased steadily as production figures broke new records. In 1972, however, production fell sharply and, while it recovered in the years to come, weaknesses in the current system were revealed. Furthermore, the programmes failed to produce stable increases and Indonesia's ability to secure a safe level of rice production came into doubt (UNDP 2001). It became clear that the Bimas programmes in their current state were not capable of providing enough food and the goal to achieve self sufficiency was not close.

In order to improve and stabilise yields, the central government decided to go one step further in the third development plan (1979-1983). This was done with special intensification programmes, *Insus*. While the old Bimas programmes targeted individual farmers, the Insus worked with groups. The groups had to work collectively and write proposals on what was needed in their group. Each group had an appointed leader (Lokollo 2002). This enabled a more efficient structure to spread new seeds and technologies. Extension officers would visit and instruct so-called contact farmers who, in turn, would spread the information to the larger group. The new system also permitted a stricter control of farmers ensuring that more of them followed instructions given by the officers (Booth 1988:152). The Insus programmes targeted several food crops but emphasis was on the rice sector. Insus meant that the system, of extension officers coming out to the farmers and training them in how to use new technologies, became the norm throughout the country (Booth 1988). The Insus

programmes were specifically concerned with areas where the Bimas had been less successful or had not yet fully penetrated. For those who did not want to work within the group, there were options of joining general intensification programmes as the *Inmum* programmes proceeded. Despite the new programmes, Bimas was still running and the old credit scheme was not abolished until 1985. Although the programme showed great success in terms of production, the default rate on the loans given to the farmers was well over 50 per cent (Sawit and Manawan: 1991:84, 98).

By 1985 Indonesia had achieved self sufficiency in rice but even then there were indications that the effects of the Insus programmes were wearing off and Indonesia was struggling to maintain the high levels of production as well as keep up with the demands of a growing population with a growing demand for rice (Sawit and Manawan: 1991:82). According to the Ministry of Agriculture, there were three problems in Indonesian agriculture. First, the land under cultivation was steadily decreasing in order to give way to industries, infrastructure and garden plots. Second, the intensity of crop cycles had to be lowered as a means to battle pests. Finally, farmers found it difficult to adopt new types of rice (Dinas 1985). In response to the looming food crisis, the Supra Insus programme was introduced in 1987 (Sawit and Manawan 1991:83). The Supra Insus programme was built on its predecessor with farmers groups and contact farmers, but extended by increasing contact between different farmer groups, thus allowing them to exchange information on how to implement new technology, battle pests etc. with a wider group. In addition, the Supra Insus programme also increased the interaction of farmers, cooperatives and producers of inputs needed in modern farming. The programme consisted of two parts. One was to give the farmers important information on modern varieties, cropping patterns, balancing the use of fertilisers, cultivation densities etc., and the other to serve as a support network for the farmers. This was done by increasing the number of extension officers visiting the groups and aiding in any way they could, but also by involving village cooperatives as agents trading inputs and providing support to companies selling farm inputs (Sawit and Manawan: 1991:84). I
n addition, the new inputs were to be financed through a new credit system, the *Kredit Usaha Tani*, KUT, which was distributed to farmer groups through the village cooperatives (Sawit and Manawan: 1991:84-86).

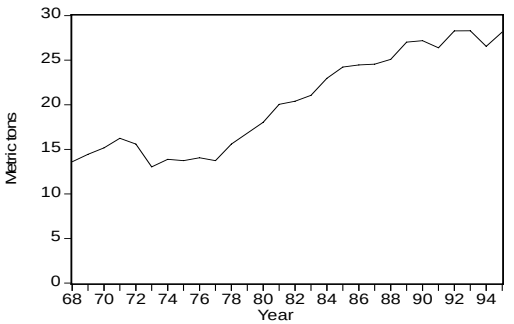
Just like the previous programmes, the Supra Insus effort started out as a small-scale project in a number of villages in West and Central Java, and was gradually implemented across the country. Since the early 1980s, there have been so-called Opsus programmes running alongside the other programmes but

directed at areas which need improved management and increased production (UNDP 2001: 82).

4.2. The effects of the intensification programmes on rice production in Java

As can be seen in figure 4.2.1 below, rice production in Java nearly doubled through the efforts of the regime under the New Order. While production rose in the initial years of the new regime, it slumped as a result of the rice crisis in 1972, due to unfavourable weather and bad management (Bresnan 1993:118-120). Despite efforts, rice production failed to recover until the Insus programmes gained momentum. With the Insus programmes, production increased steadily in Java until the mid-1980s, after which the effects of the programmes wore off and though there was no slump, like the one seen in the early 1970s, growth in production more or less levelled out. The next significant jump in production occurred at about the time of the gradual introduction of the Supra Insus programmes across the island of Java. It is interesting to note that while the Insus programme had a long lasting effect, its successor seems to have more or less resulted in a one-time shift in production. It is fair to say that although the Bimas and Supra Insus programmes had an effect on rice production, the big increase seems to have come under the Insus programme.

Figure 4.2.1 Rice production in Java 1968 - 1995



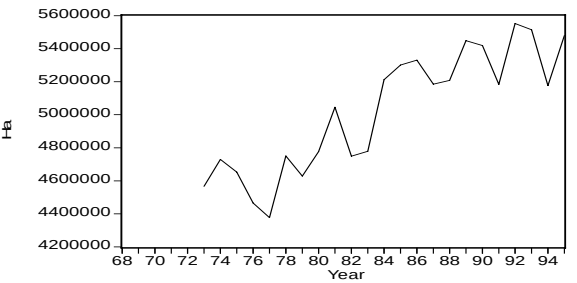
Source: BPS, *Statistical Year Book of Indonesia*, various issues. 1979 was extrapolated from 1978 and 1980.

Production increases may not only have been a result of the intensification programmes, but also an effect of more land used for rice cultivation. Figure 4.2.2 shows clearly that the area under cultivation increased considerably under the Suharto era. Despite the increase, there are a few issues which need to be kept in mind. Although the land used for rice only grew by twenty percent, production more than doubled. This in itself indicates that intensification must have played a significant part in the rise of production. This was perhaps not so surprising since the shortage of land had already been severe at the start of the New Order.

The increase that did occur, however, was a result of a number of things. First, rice was given paramount priority and the increase of rice cultivation was at the expense of other crops. This policy and its effects will be discussed more thoroughly in the next chapter. Second, areas which had previously been used for other purposes, or had just been left alone as they were not suitable for rice cultivation, were now claimed. This could be done thanks to the improved irrigation systems (Eng 1995).

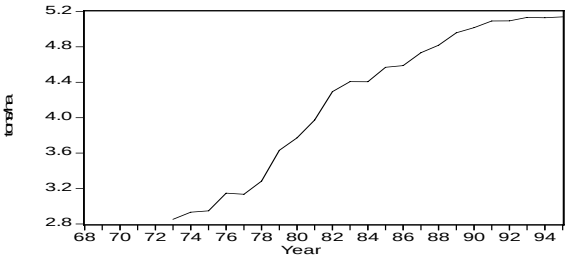
Another aspect worth mentioning is that while growth in production was fairly stable with growth spurts occurring in certain periods, the same cannot be said for the area under cultivation. In fact the area under cultivation fluctuated from year to year and was dependent on factors such as rainfall and pests.

Figure 4.2.2 Area under rice cultivation in Java 1968-1995



Source: BPS, *Statistical Year Book of Indonesia*, various issues

Figure 4.2.3 Yields in Javanese rice cultivation 1973-1995



Source: BPS, *Statistical Year Book of Indonesia*, various issues

It is thus safe to conclude that with the area under rice cultivation not increasing as fast as production, the increased production must, as Booth argues, have been the result of increases in yields (table 2.7 in Booth 1988:39).
The increase in yields is clearly illustrated in figure 4.2.3. The increase in production and productivity can be divided into three periods, which can be related to the intensification programmes as discussed above. First, the gradual increase in the 1970s under the first Bimas and Inmas programmes. Second, the rapid increase of the 1980s. These increases, however, are largely confined to the beginning and end of the 1980s which coincide with the Insus and supra Insus programmes. Finally the last period of the 1990s shows a very small increase which can be related to the diminishing effects of the intensification process. In order to achieve and maintain high productivity, ever-increasing amounts of fertiliser are needed as the soils are depleted. Despite the increase in fertiliser use the soils get saturated with salts and other minerals which will have a detrimental effect on yields (Pingali 1997).

4.3 The Extension system and production in Yogyakarta

From the discussion in the previous section, it is clear that intensification programmes had a decisive impact on yields for Java as a whole. The discussion now turns to the extension system and its impact on Yogyakarta.

By 1968 the Javanese land frontier had long been reached and agricultural production had not been able to keep up with the population growth since before the Second World War (Bresnan 1993:116; Booth 1998:66). The dire situation in the country as a whole was mirrored in Yogyakarta. In 1962 the government

set the annual rice intake at 100 kilos of rice per person. In Yogyakarta, however, the yearly intake only reached 70 percent of that in 1968, an indication of just how dire the situation was in the region at that time (Dinas 1968:1).

Naturally, the national effort to increase production also covered Yogyakarta. After initial trials with the Bimas model in Bogor, the system grew under the New Order and eventually reached Yogyakarta. In 1967 there were three types of Bimas in the special region of Yogyakarta. First, the national Bimas programmes that only provided the farmers with credit. The credit could be used for all inputs in the production as well as for buying tools. The loans had to be repaid after harvest of the increased yield. The plan was that the increased production with the new types of inputs would help to settle the debt and leave a small surplus for the farmer (Dinas 1973). The second type of programme was called Bimas *berdikari*, which was basically a version of the national Inmas programme as they were only concerned with the logistics of inputs. These programmes were not as costly for the government and were only a complement to Bimas in achieving the goals (Dinas 1973).

The third type of Bimas was called *pupuk hijau* (green fertilisers), which was more or less the same as the type two Bimas but primarily concerned with organic fertilisers. These were on a much smaller scale and thus had little impact on the farming community (Dinas 1967). When the efforts to expand production increased, there was no longer room for organic fertilisers within the intensification programmes, and in fact many farmers were strongly advised against it (Farmer 1. Bantul, 2006). Hence, the two main vehicles for agricultural development became the Bimas and Inmas. This is not to say that farmers stopped using organic fertilisers as they served as a good complement to the chemical varieties and helped to replenish the soil. Furthermore, organic fertilisers were not as costly (Farmer 1. Bantul, 2006). As on a national level, these Bimas programmes were followed by Insus in 1979 and finally Supra Insus by the end of the 1980s.

Although Bimas and Inmas were already active in Yogyakarta from the beginning of the New Order, efforts were initially very small with only one extension officer in each of the four regencies. Furthermore, the system was chronically short of funds, but some actions were taken in order to improve production (Dinas 1968). Farmers took part on a small scale in the Bimas programmes, which provided them with new seed types, fertilisers and pesticides. There were, however, problems with infrastructure and inputs were often in short supply or arrived too late for the farmers to be able to use them (Dinas 1968).

In order to increase yields, extensive methods were also used as fields previously intended for other crops were transformed into rice fields. There were also efforts to improve the irrigation system in the area, a project which was co-funded by the farmers themselves through *Gotong Royong* (Dinas 1968).[11]

Finally, farmers in the area had difficulties with vermin and pests. While the problems were more acute in some years than others, there was always an underlying risk of disaster (PPL officers in Bantul and Gunung Kidul 2004, 2006). Since an increased yield could be achieved by preventing the crop from being spoilt, there were special brigades who helped the farmers to kill or prevent vermin and pests. The brigades allowed the farmers to gain an insight into how other areas had dealt with similar problems, thus increasing their efficiency (Dinas 1979).

By 1969 Indonesia had made some headway out of the immediate chaos surrounding the abortive *coup d'etat* in 1965. In the same year the government embarked on its first five year plan. The national plan was strongly biased towards agricultural development, promoting the sector so as to turn it into a dynamic motor of development and the driving force of industrialisation and prosperity (*Repelita* 1 1969, chapter 1). The paramount goal of the plan was of course to achieve self-sufficiency in rice. The implications on a national level, as discussed above, naturally had implications on a local level as well. A programme was set up in Yogyakarta in response. The programme identified a number of key issues that required special attention, which in the case of Yogyakarta were summed up in the yearly report from Dinas in 1973(Dinas 1973).

First, the development of areas already under intensification programmes. More farmers were to take part in instructions on how to use the new High Yielding Varieties (HYV) and fertilisers, and credits were to be increased in order to enable them to adopt the new technologies.

Second, the areas under the Bimas programme were at this time still relatively small, and as the yields per ha in the Bimas fields were significantly higher than in those outside intensification, it was crucial to get more land within the programmes. In addition, the Bimas were also to be extended through the opening up of new fields. These lands included old roads, pastures and fields previously used for other crops.

[11] Gotong Royong is a customary Javanese agreement founded on a reciprocal exchange of labour. If a farmer is in need, other farmers can, through Gotong Royong offer help. The recipients are in turn expected, according to ability, to provide assistance to others when needed. In modern times it has been used by the state as a means to finance larger communal development projects such as roads and irrigation works (Mulder 1998:62-63; Bowen 1986).

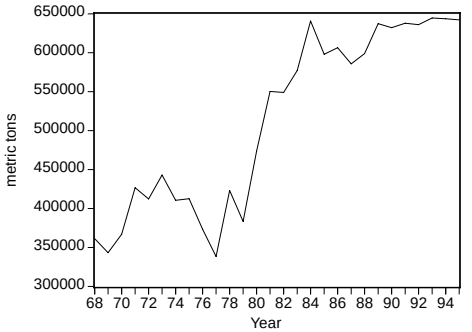
Third, the spreading of the HYV and all other inputs needed in the new development programme was very important. The local government had to ensure that the farmers began using them by making the inputs readily available through marketing and distributional mechanisms. It was also important to have the other physical requirements, such as irrigation systems, in order.
Finally, at this time the extension system was very small and it was important to build this into a larger organisation with village cooperatives and research stations as well as seed beds and storage facilities.

While a key issue was the response to the first development plan, it may be said to have played a very important role throughout the New Order under the three branches of intensification, extensification and, from the later years of the regime, diversification. Naturally, as the years went by, the land potential for rice cultivation was depleted or actual rice fields were claimed for other activities. The need for intensification was the most pressing. From year to year, as the programmes expanded into Insus and Supra Insus, the staff and resources expanded (Dinas 1988).

As seen in figure 4.3, production in Yogyakarta followed the trend of the whole island and was drastically higher by the end of the New Order. It is interesting to note that while the rest of the country experienced a decline in production as a consequence of the rice crisis in the seasons of 1972/73, Yogyakarta was actually increasing production. Production did, however, decrease dramatically thereafter. According to local reports, the decline in Yogyakarta was not so much related to policy as to natural disasters, weather, pests and vermin (Dinas 1972-1976.) It is true that there were some major natural disasters e.g. the eruption of the volcano Merapi, but it seems to easy an explanation.

In conjunction with the new intensification programmes of the late 1970s, a steep improvement of production was achieved in the first half of the 1980s. A decline followed thereafter but not as catastrophic as in the mid-1970s. The decline was halted by the introduction of the Supra Insus programmes, which caused production to increase once again, but only to get the levels up to those of the mid-1980s. In conclusion, rice production in Yogyakarta increased drastically over the whole period but the greater part of this increase seems to have taken place during the second development phase, the Insus programmes.

Figure 4.3. Production in Yogyakarta 1968-1995



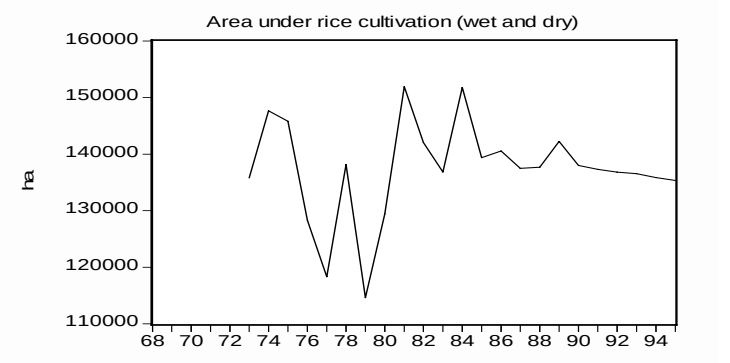
Source: BPS, *Statistical Year Book of Indonesia,* various issues; BPS, *Yogyakarta in Figures,* various issues

4.4. Productivity; returns to land in Yogyakarta

Production of rice in Yogyakarta increased dramatically during the New Order. At the beginning of the New Order, the land frontier was all but closed, and any increase of land under rice had to be made at the expense of other crops or by transforming less fertile land.

In figure 4.4, though, it is clear that the area under rice cultivation in Yogyakarta was, just like for the whole island, very volatile during the 1970s and early 1980s. Thereafter it levelled out and decreased steadily until the end of the Suharto regime. The great variations were predominantly a consequence of the weather. A dry season meant less land under wet rice. In addition, Yogyakarta experienced problems with the water supply from the big waterworks in Bligo, which normally ensured a steady flow of water even in dry years (Dinas 1976:25-26, 1977:31-32). Thereafter there were some peaks in 1981 and 1984. After the volatile late 1970s and early 1980s, the land under rice cultivation was more stable. While less unstable from the mid-1980s it is evident that there was a steady decline back to the levels of the early Suharto era, due to several factors. First, the area used for rice had to give way to other more profitable industries. Second, some areas had to give way to housing, infrastructure etc. Finally, some fields were reclaimed for crops other than rice (Dinas 1992, 1995). With the fluctuating yet stable area under rice cultivation,

Figure.4.4 Area under rice cultivation (wet and dry) in Yogyakarta



Source: BPS, *Statistical Year Book of Indonesia*, various issues; BPS, *Yogyakarta in Figures*, various issues

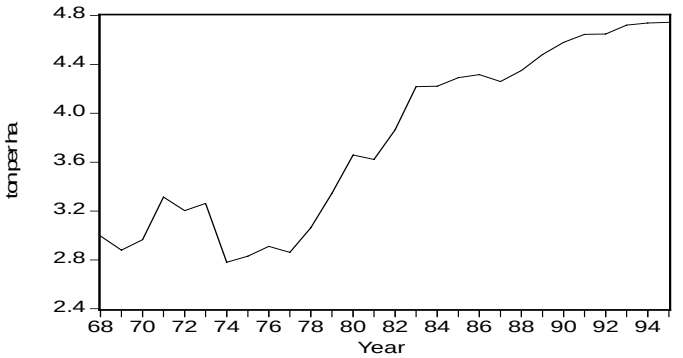
but an evident increase in production that does not reflect these heavy ups and downs, it is clear that the development in Yogyakarta was not a result of extensive growth.

4.4.1 Development under Bimas

It was made clear, above, that extensive measures had little to do with production increases in rice production in Yogyakarta. Turning to yields per hectare for the whole period, it can be seen in figure 4.4.1 that there was a dramatic increase of productivity over the whole period. Yogyakarta, like the rest of Java, was not just suffering from a shortage of land but also extreme population densities (Dinas various years). As with the case of Java, an economically rational approach to agricultural development was to introduce land-saving technologies. The dramatic yield increases that did occur are thus very much in accordance with the theoretical approach used in this study.

The Bimas programmes under the first development plan were primarily concerned with an increased production of rice. Both wet and dry rice types were grown in Yogyakarta but the programmes primarily targeted the wet fields.

Figure 4.4.1 Rice yields in Yogyakarta 1968-1995



Source: BPS, *Statistical Year Book of Indonesia*, various issues

The Bimas programmes began on a very small scale but grew rapidly throughout the 1970s. In 1969, 50000 ha were under the intensification programmes; by 1974 it had increased to 75000 ha (Dinas 1969, 1974). At that time virtually all the fields were under Bimas. Those farmers not officially participants in the intensification programmes were most likely also following the advice of the extension officers, as they could see the increased yields in the fields under intensification (PPL Officer Gading Sari, Bantul, 2004)

In addition to the Bimas programmes, there was a support network aimed at helping and facilitating the farmers in their adoption of new technology. The network included two institutions, the people's bank, *Bank Rakyat Indonesia* (BRI), and the village cooperatives, *Koperativ Unit Desa* (KUD). The Bimas programme in Yogyakarta was based on the national level model, giving a package to each of the participating farmers. The package, as seen in table 4.4.1, contained new miracle seeds, fertilisers, pesticides and training on how to use the new technologies. The package was distributed by the KUD and financed through the BRI at a very favourable interest rate (Bimas 1972). The initial adoption rate of the new seeds was not very high. This was due to the farmers' reluctance to use new seeds, but also because there were distributional problems causing the seeds to arrive too late or, as often seemed to be the case, not at all (Dinas 1974). In order to avoid this there was a programme run by Bimas and aimed at increasing availability through building new seed nurseries and rehabilitating old ones (Dinas 1974-1979). There were also projects to increase the quality of seeds grown in Yogyakarta.

Table 4.4.1 A Bimas bundle (per hectare)

Item	Volume	Cost (Rupiah)
Fertiliser		
Urea	200 kg	8,000
tsp	50 kg	2,000
Pesticides		
Insecticides	2 lt.	1,800
Zink phosphate	0,1 kg	115
Seeds	-	2,000
Pest prevention	-	800
Added costs	-	5,000
Total cost (loan)		**19,715**

Source: Dinas 1974

In addition to ensuring local supplies, there were also efforts to improve the marketing and sales side to guarantee a steady and secure import of seeds to the region. This was done through marketing guidance in all of the five regencies in Yogyakarta (Dinas 1974). The projects started on a small scale but grew gradually from year to year. In 1974 the target was to have seed gardens of 600 hectares in twelve locations, producing 600 tons of seeds which covered roughly 36 percent of the needs in Yogyakarta (Dinas 1974). The capacity of the new and rehabilitated centres was minor throughout the 1970s. Instead, a majority of the seeds came from either the sales of state monitored vendors or were produced by the farmers themselves (See Dinas 1974 and 1979).

While there was a gradual increase in the adoption of the new miracle seeds, the use of fertilisers increased rapidly. Perhaps the main reason for this was the fertiliser subsidy that had been implemented since 1973/74. Urea was sold at 80 Rp per kilo until 1976 when it was reduced to 70 Rp. The initial price of urea had been set to a 1:1 ratio to the farm gate floor price of unhusked rice. As a consequence of the lower price and increasing rice prices, the ratio gradually grew to 1:2 (Dick 1982:31). The state had thus created a strong economic incentive for the use of chemical fertilisers. Despite this it remains unclear how much of this was actually used in the rice fields, as much of it could also be used for improving yields of other more profitable crops (Booth 1988). While the high-yielding varieties could be produced locally, fertilisers were imported. The fast adoption of fertilisers led to an actual shortage.

The monopoly on distributing inputs to the farmers did not work very well, as many of the deliveries were slow and did not turn up on time. The goods that

did turn up were generally insufficient. As a consequence there were more players entering the scene and many state-owned companies had subsidiaries in the villages, selling from little kiosks (Booth 1988). By 1979 there were 428 private and cooperative kiosks covering the area in Yogyakarta, including representatives from both the state owned fertiliser company *Pupuk Srivijaya* (Pusri) and the logistics firm Bulog (Dinas 1975, 1979). In the first years of implementation there was only one package available to the farmers and in the mid-1970s the farmers were offered a number of credit schemes with varying amounts of fertilisers.

As mentioned above a vital part of the package was the instructions on how to use it. For this there were two principal approaches. First, Bimas performed trials throughout Yogyakarta as a means to improve the use of new technologies under local conditions. The number of trials increased every year in Yogyakarta, and covering all four regencies. The trials were often conducted in combination with the second type of instruction, demonstrations in so-called *demplots*. The purpose of these was twofold. It was important to show the farmers the benefits of new technologies, as a good harvest in the demonstration area made it easer to convert reluctant farmers (Interview with PPL officers in Bantul and Gunung Kidul 2004, 2006). In addition, the demplots served as instruction grounds for the farmers willing to learn. In these fields the farmers could practice the new methods and share in their experiences (PPL officers Bantul 2004, 2006; Farmer 1. Bantul, 2006; Farmer 4. Bantul, 2006). The trials and demplots, however, required manpower and as the Bimas programmes grew, so did the number of extension officers (See Dinas various years). The Bimas programmes on the whole meant an increase in yields per hectare. Despite this success, development was volatile and a good year could easily be followed by a very bad one. It was therefore important to find a policy which could not only increase production but also maintain it.

4.4.2 The development under Insus

The 1970s had occasionally shown great results in terms of production increases, but it is clear that the results varied greatly over the years and production seemed to level out after a few years. In Yogyakarta there were some explicit reasons for the Bimas programmes coming to a halt. First, there were problems with bad weather and pests in the area. The intensification programmes promoted several rice crops in a row, which initially increased production but was also a good growing ground for the brown grasshopper.

Skipping one rice crop in favour of dry crops was necessary to maintain high yields.

Furthermore, many farmers were unable to join the Bimas for a second or third term as they had not yet repaid their debts. The credit system in Yogyakarta had a default rate of up to 80 per cent in the early 1980s (Dinas 1982). As in all Bimas areas, the loans had been taken individually and BRI had difficulties enforcing strict payment plans. Third, the new rice types were costlier than the older varieties and thus the farmers were reluctant to use them (Dinas 1990:3).

Finally, there were bottlenecks in the system which meant that the farmers could not utilise Bimas fully as the credits were tied to specific inputs. Besides, a shortage of seeds led to fewer farmers utilising their full credit for fertilisers. These credits could then not be used by other farmers or for other purposes. There was thus a need in Yogyakarta, just as there was on a national level, to tighten up the control system, coercing the farmers to not only use the inputs required by the state but also pay back their loans. The tool used was peer pressure, making the farmers get into groups which were responsible for credit as well as what was to be grown. In 1979, Yogyakarta came under the Insus programmes, which were divided into the special intensification programmes *Insus* and the *Inmum* general intensification programmes. The latter were to a large extent the continuation of the old Bimas programmes.

The acceptance of modern varieties grew gradually throughout the Bimas programmes. Despite this about a third of all land was under local varieties as late as 1980. Four years later the figure had declined to under one per cent, and by the end of the Insus programme the farmers using local varieties were virtually non existent (Dinas 1981:72; 1984:73; 1987). The general acceptance of new varieties was perhaps not surprising as yields in the demonstration plots were 1202 kilos higher than in ordinary fields. Not only did the regime exert a certain amount of pressure on the farmers, but the new varieties also became the most economically viable type of rice (a general view among farmers). The farmers could see that there was little risk involved in new varieties and thus their food security was never really jeopardised. In addition, those who had suffered from pests in their fields in the late 1970s had little choice but to switch to newer, more resilient, types (Farmer 2. Bantul, 2006).

The dominant rice types of the Insus programmes were the three varieties Ir36, *Cisedane* and *Kruing Aceh*, while local varieties were used by less than one per cent of the farmers. By the end of the Insus programme, a new variety Ir 64 was introduced (Dinas various years).

With the ever greater acceptance of the new seeds, the use of fertiliser kept increasing as well. In the early years of the Insus programmes, the farmers used two types of fertilisers, Urea and TSP. In 1980 the farmers would use an average of 245.6 kilos of urea and another 64.65 kilos of TSP per hectare (Dinas 1980). Towards the end of the period, other types of fertilisers such as NPK and KCL were introduced. The farmers then used a total of 308 kilos per hectare. In addition there was evidence that the use of organic fertiliser in rice cultivation was steadily declining (Dinas 1986).

Productivity in terms of yields per hectare increased sharply in the first years of the 1980s. Thereafter, it levelled off but still experienced a slight increase. The sharp increase coincided with a decline in the use of local varieties and it is reasonable to assume that once all the farmers used modern varieties of rice and less organic fertilisers, the system was not capable of increasing yields much further. On a national level the response came in the form of Supra Insus.

4.4.3 Development under the supra Insus

The Supra Insus programmes were gradually introduced throughout Indonesia, so the area under them was therefore initially rather small. In addition, the Supra Insus programmes only included wet rice and, as Yogyakarta was still a mainly dry rice area, it was on a smaller scale. It is also important to note that just as the Bimas programmes were not disrupted by the introduction of the special intensification programmes, the Insus programmes ran parallel to the new programmes. It was not until the last couple of years of the Suharto regime that the Supra Insus programme in Yogyakarta was larger than its predecessor.

The Supra Insus programmes, as the name indicates, had their roots in the previous Insus and thus the efforts were very similar, with an emphasis on modern seeds and fertilisers. In the previous years the dominant rice types had been Ir 36 cisedane and Kruing Aceh. While Ir 36 and Cisedane were still popular, Kruing Aceh was no longer one of the more important seeds. Instead, the most important was Ir 64, followed by Ir 36 and Cisedane. Until the end of the New Order, the use of Ir 64 increased steadily to cover more than half of all fields, whereas the local varieties accounted for no more than ten per cent of the total acreage under rice cultivation (Dinas 1987-1996). The increased use of the new rice variety Ir 64 was due to a number of factors. For starters, it was more readily available, since the regime ensured that it was the principal seed produced and imported under their guidance. In addition, the trials showed that the new varieties gave much higher yields. Finally, the intensification programmes had at that time been active for more than 20 years. As a new

programme built on an old one, the farmers knew what to expect and the increases in production facilitated by previous transformations made it easer to convince the farmers of the advantages of Ir 64. As a result of the good track-record of the intensification programmes, it became natural for many farmers to adopt the new seeds when these flooded the market.

While the new seeds gave higher yields, they were also more demanding in terms of fertilisers and other inputs. This is evident when observing that the amount of fertiliser used per hectare was up to 347 kilos in 1993 (Dinas 1993). With the Ir 64 as the most dominant rice type and local or older rice varieties diminishing in importance, a more extensive use of fertiliser yet again led to an increase in the yields per hectare. The increase is substantial but not as great as it had been during the previous Insus programme.

4.4.4 Summary

To conclude, the farmers in Indonesia, Java and Yogyakarta were backed by a state apparatus dedicated to increasing rice yields through biological and chemical modernisation. To advance into land-augmenting technology, according to Hayami and Ruttan, was the way to go forward for a country with increasing land scarcity, and the path chosen in the Indonesian case was hardly surprising. The extension system in Java grew gradually and small improvements were made along the line to offset any signs of stagnation. While the efforts worked slowly in the early phase with farmers reluctant to use the new inputs, the system gradually became more efficient. The efficiency can be attributed to two factors. First, the system learned how to better control the farmers, tightening up control mechanisms by using peer pressure. The farmers simply had little choice but to follow the directions of the regime, regardless of the effect modernisation may have had on their ability to prioritise safety. The state thus effectively offset Scott's moral economy. Second, as a result of visibly higher yields and the problems with older rice varieties, the farmers could see for themselves that modern inputs had a positive effect on production, showing that the farmers were not against modernisation per se, when evidence mounted in favour of new varieties.

The results of the intensification programmes were great but each programme stagnated after a couple of years, making it necessary for new efforts. In sum, production in Yogyakarta increased to almost double that of the pre-Suharto era. As for yields, results are equally impressive, going from under 3 tons per hectare at the end of the Sukarno regime to a staggering 4.74 tons in 1995. The increase in productivity seems to have been more or less continuous

from the Insus programmes in 1979 to the end of the Suharto regime, with the exception of a few years in the middle of the 1980s.

4.5. Productivity; returns to labour

During the New Order there was a steep increase in yields and production rose sharply in Yogyakarta. This was important in securing food for the growing population, to stimulate development and increase prosperity. It was equally important to increase labour productivity so as to release resources to other sectors of the economy. Achieving a higher production without increasing the efficiency of the labour force will lead to a stagnating agricultural sector and cancel any temporary benefits that an increased production may have caused. Geertz stressed the importance of not just increasing the yields per hectare, as this is an imaginary solution leading to a poverty trap, but raising it to a new slightly higher level to avoid a poverty trap and involution (Geertz 1963:146).

Labour productivity will be discussed from two perspectives in this section. First, in terms of what the authorities deemed as the proper labour requirements per hectare, followed by a discussion on the actual number of people in the sector. Then follows a discussion closely related to mechanisation and the efforts made by the state to mechanise agriculture in Yogyakarta. The focus in this section is, as above, on rice cultivation as it was the most dominant crop in the development project of Java and Yogyakarta.

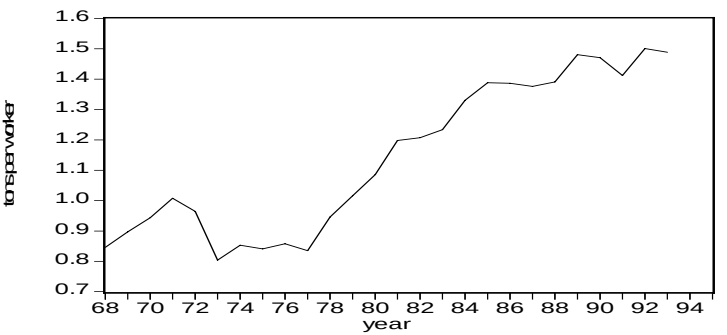
Java was, and is, one of the most densely populated areas of the world and it is only natural to expect a slow mechanisation process. The expected development of Javanese agriculture should be an emphasis on labour-intensive methods, but as production increases and the ability to feed the cities improves, a flight of people from the rural areas will occur and we should see a higher level of mechanisation and labour productivity. That labour productivity was low in the 1970s is expected, but then it ought to have picked up pace as self-sufficiency was achieved. The development policy, as reflected in the five-year plans, however, gave contradicting opinions on the role of agriculture in Java. On the one hand, the plans stressed how important it was to create a dynamic and efficient agricultural sector with the help of modern technology, including labour-saving machinery. On the other hand, they also stated that an important role of agriculture was to absorb surplus labour (see *Repelita* 1-5 introduction).

According to Eng, labour productivity was very low before the New Order, but increased steadily throughout the regime. He also argues that productivity increased more rapidly in the 1980s and 1990s (Eng 1995). This may be true if

all food crops are included in the analysis, but if rice, as the single most important crop in Java, is studied separately, a somewhat different picture appears. Looking at figure 4.5, which gives an overview of rice production per labourer in Java during the New Order, there is no denying that labour productivity increased drastically over the time period. A closer scrutiny, however, shows that while Eng describes it as a gradual process, the main increase took place in the late 1970s and early 1980s.

After 1985 there was still an increase but it had lost momentum. There were serious worries on the part of researchers within the Agro Economic Survey Project[12] that labour saving technologies would displace and marginalise a large number of people in the rural economy. The worries, however, seemed to be unfounded, as there was little evidence of this rural population being marginalised by the end of the 1980 (see Manning 1998:89). The marginalisation had to some extent been offset by new labour opportunities rising in other more labour-intensive branches of agriculture as well as within the growing service sector (Booth 1998). Even so, in absolute, terms the agricultural labour force actually increased until the early 1990s and it is not unreasonable to believe that many remained in rice cultivation as labour demand had increased with the introduction of modern inputs (Manning 1998:88-89). The reasons for the increase in productivity that did occur will be discussed at greater length below.

Figure 4.5 Yield per worker 1968-1994 in Java



Source: *Statistical Yearbook of Indonesia*, various issues, Eng(1995)

[12] The Agro Economic Survey was a project which, under the supervision of D. Collier, undertook a number of studies in rural Java under the 1970s. Although of different quality the numerous reports offer a good overview of the development of rural Java in the 1970s(White 2002).

Before turning to Yogyakarta it is worth noting that, in comparison with other countries in the region, the share of the labour force remaining in agriculture was high in Indonesia (Manning 1998: 90-92).

4.5.1 Returns to labour in Yogyakarta

When looking at labour requirements it is important to distinguish between two types of cultivation, wet and dry paddy. Wet rice is significantly more labour-consuming than dry rice but gives a much higher yield. In this study the focus will be on wet rice cultivation as it is the most dominant cultivation method in the area. Furthermore, the development programmes for self sufficiency were centred on wet rice production.

Dinas Pertanian did not start to calculate labour requirements on a regular basis until 1977, which is an indication of the priorities of the regime (Dinas 1977). In Table 4.1 it is interesting to note that labour requirements decreased significantly with the introduction of the Insus programmes at the end of the 1980s. The decrease can be partly explained by labour-saving effects that land-saving policies may have had. The more obvious reason is a beginning modernisation of tools used by the farmers, combined with herbicides which reduced the time spent weeding. Moreover, the irrigation system played an important but not very clear role. Better irrigation meant an increased yield and thus a larger workload, and reduced time spent on retrieving water (Booth 1988:178).

After a significant decrease in the early 1980s, labour requirements stabilised until the very end of the New Order when it once again increased significantly. The first labour-saving change occurred at the same time as the Insus programmes were introduced to the region, but it is interesting to note that there seems to have been no similar effect as the Supra Insus programmes gained momentum. In fact, it seems to have been quite the opposite.

Figures for labour requirements alone, however, say very little about productivity in the agricultural sector. When combined with figures for agricultural output in the rice growing sector, a better picture of productivity is obtained. It is evident that there was stagnation in labour productivity in the wet rice sector until the end of the 1970s. Thereafter there was a steep increase lasting a few years, but this was followed by another period of static labour use, albeit on a somewhat higher level than in the previous decade. At the end of the Suharto era there was another increase in return to labour but nothing to equal the shift in the late 1970s (Dinas 1977-1995; BPS, *Yogyakarta in figures*, various issues).

Table 4.1 Labour requirement in Yogyakarta 1977-1995

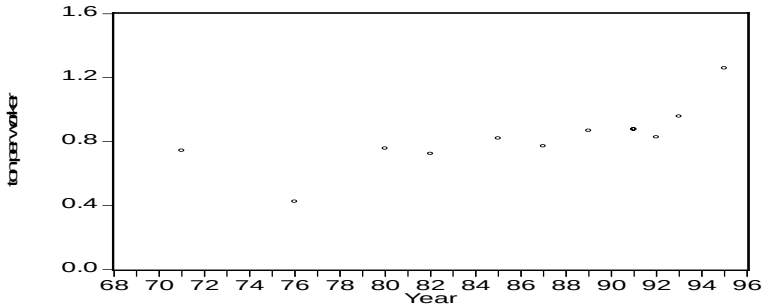
Year	Labourer/ha	Year	Labourer/ha
1977	406	**1985**	313
1978	453	**1986**	336
1979	453	**1987**	337
1980	381	**1988**	334
1981	265	**1989**	333
1982	285	**1991**	334
1983	311	**1992**	332
1984	289	**1995**	352

Source:Dinas1977-1995

Note: Some years have been omitted as only an average for both wet and dry rice was available.

While wet rice was an important crop in the region, dry rice also played an important role as irrigation networks were not extended to the arid areas of Gunung Kidul. All types of rice grown in Yogyakarta are included in figure 4.5.1. In addition, the figures for labour requirements were calculated by Dinas, and therefore may not reflect reality. The figures are based on the actual number of workers active in agriculture giving a more accurate idea of labour prodcutvity. This method does not only allow for greater accuracy, but also lends itself to a better comparison with the situation in the whole of Java. Figure 4.5.1 shows that labour productivity in Yogyakarta under the New Order was not as good as in the rest of the island. Labour productivity did not increase by much more than ten per cent in the 1980s, but in the early 1990s there was a more rapid change. This is discussed in greater detail in the next section on mechanisation. Despite these differences, it is clear that the 1980s in Yogyakarta was not a time of significant productivity increases. The view we get from Yogyakarta does not totally correspond to the development of the island of Java as a whole. As in the case of Java, there was a very large increase in productivity at the end of the 1970s. However, the large increase in Java was not followed by static development, but rather an increase of productivity, albeit on a much smaller scale. As in Java in general, there was another significant increase in the early 1990s.

Figure 4.5.1 Labour productivity in Yogyakarta under the New Order (rice)



Source: BPS, *Statistical Yearbook of Indonesia,* various issues; Dinas various issues; BPS, *Yogyakarta in Figures* various issues

4.5.2 Mechanisation in Yogyakarta

From the discussion above it is safe to conclude that the green revolution in Yogyakarta, while increasing production dramatically, initially had a detrimental effect on labour productivity. To a certain extent, this changed by the end of the 1970s, only to be met by a slowing down of development for the most part of the 1980s. In order to understand why this was the case, it is important to examine how mechanisation was treated by the state as well as by the farmers.

A closer look at state efforts to increase labour productivity in Yogyakarta during the Suharto era shows that they were few and far between. In fact there was a discussion about the hazards of introducing labour-replacing technology (*Repelita* 1 Chapter 1). It is important to note that there was at this time a worry that the agricultural sector was unable to absorb the rapidly growing labour force. The sector was therefore seen as an important tool not only for producing more food for the growing population but also for providing them with work. This was reflected both on a national level, in the five year plan, and on a local level, in reports from the extension services (see Dinas 1973). A full commitment to mechanisation and modernisation of tools used in agriculture was therefore not entirely obvious. From a theoretical point of view this approach made sense.

In general, it is therefore difficult to see a straightforward policy towards mechanisation. There are, however two fields in which it is clearly seen. First, the introduction of hand sprayers, which were important tools in battling any

type of pests or bugs that the new varieties were so vulnerable to (Dinas various issues between 1970-1995). These poisons were needed in order to attain self-sufficiency in rice. As a consequence, hand sprayers were included in the Bimas programmes and were promoted both through credit schemes and training on how to use them (see for example Dinas 1974). The hand sprayers were instrumental in the battle against various pests and vermin and the promotion of these tools should perhaps be seen as a way of minimising production losses rather than decreasing labour requirements.

The second type of government-aided mechanisation project was the renovation of the irrigation systems. In the wet lowlands, such as Bantul, mechanisation entailed installation of pumps and upgrading of existing sluices. In Gunung Kidul, on the other hand, the pumps were at the heart of the irrigation projects. A great number of pumps were installed in newly drilled wells, in the early 1970s. These projects continued throughout the region. In the area around Sanden in Gunung Kidul, the late 1970s saw major improvements in access to water as big pumping stations were installed, making possible extensive irrigation systems with canals stretching out into the villages (PPL officer Gunung Kidul, Duwet, 2004). While there is no doubt that the modernisation of irrigation systems qualifies as mechanisation of agriculture, arguably it does not substitute machine for man. In Yogyakarta the larger investments in irrigation took place in the 1970s. Thereafter investments were made to maintain and repair the network. In the village of Duwet in Gunung Kidul, for example, the pumps and irrigation networks were built in 1976, after which the system was repaired on a regular basis (PPL officer Gunung Kidul, Duwet, 2004).

There are, however, many other types of mechanisation that are labour-replacing. Several parts of the farming process, such as land processing, harvesting and the post harvest practices may be mechanised. Here, we focus on three types of mechanisation, namely tractors in the land processing stage, sickles and threshers in the harvest stage and finally hullers and rice mills in the final post-harvest processing stage. Not all productivity changes are a consequence of mechanisation but rather an effect of modernisation of tools. An example is the transition from the ani-ani knife to the sickle in harvest methods.

4.5.2.1 Tractors

Tractors, often of the Ferguson type, were used across Java during the Sukarno era but were few and far between. Furthermore, by the time the green revolution of Suharto started, these tractors were too old (see Dinas 1968-72). Thus tractors played no significant role in Java before the green revolution.

As seen above, the 1970s saw a great upswing for agricultural development in Indonesia in general and in Java in particular. The emphasis was on biological and chemical modernisation, and while the Bimas programmes led to an increased use of hand sprayers, the state showed very little interest in other types of mechanisation. There was a tripling of the number of tractors in Java during the new order, but the main increase occurred in the first couple of years of the 1980s followed by a longer time of static levels and an increase in the 1990s. However, the increase was not evenly distributed throughout the island. Instead, certain areas in West Java contributed to this increase (Naylor 1992:81). Despite this increase, it is important to remember that, in comparison to other countries such as Japan and China, Java was still significantly behind (Booth 1988:181).

In Yogyakarta, as in the rest of Java, tractors started appearing by the end of the 1970s (Agro Economic Survey 1982:ix). This effort to mechanise was, however, not an effect of state policy but rather an initiative from a number of rich farmers who imported their own tractors from abroad. These tractors were not subsidised but still affordable for the richer farmers as a consequence of favourable exchange rates and good deals from the Japanese and Taiwanese tractor manufacturers. On a national level there were readily available credits but the farmers in Yogyakarta do not seem to have benefited from these schemes (Booth 1988; Dinas 1986:136). Many farmers saw the advantages of the new tractors but most could not afford them (Farmer 1. Bantul, 2006). Another obstacle was that in order to buy a tractor on credit there was a need for a land certificate and until the mid-1980s most farmers did not have these (PPL officer, Sri Hardono, Bantul, 2006). Most commonly, the richest farmers would buy a couple of tractors and then let them to other farmers.

Table 4.5.2.1 Tractorisation in Yogyakarta

Region	***Tractors/000 ha***							
	1981	**1985**	**1987**	**1988**	**1990**	**1992**	**1994**	**1996**
Yogyakarta	0.388408	0.848921	1.885571	1.924823	2.673739	4.087404	4.86466	6.37475
Bantul	0.414484	0.978474	3.710868	3.783251	4.151617	4.21019	5.533629	n/a
Gunung Kidul	0.431872	0.820056	1.208824	n/a	1.073949	n/a	1.171156	3.349117

Source: BPS *Luas Penggunaan Tanah dan Alat Alat Pertanian*, various issues; Dinas various issues; Naylor (1992)

In Yogyakarta this was done by President Suharto's cousin who had bought a tractor as far back as 1976 (PPL officer, Sri Hardono, Bantul, 2006).

It is evident in the table above that tractorisation took off in the early 1980s. The tractor ratio more than doubled between 1981 and 1985 and tripled by the 1990s. Thereafter tractorisation continued strongly but at a significantly slower rate. Bantul showed an even stronger trend in the early 1980s but levelled out much quicker. Gunung Kidul, interestingly enough, started out on a level higher than Bantul, but soon trailed behind as development slowed down. This wave of mechanising was introduced in much the same way as the previous few tractors, by richer entrepreneurial farmers who saw the advantages of using tractors, instead of cattle, for ploughing. The state still played a passive role in the introduction of these machines. The extension officers in Bantul, for instance, informed farmers about tractors but did little else as they lacked both resources and directives to do more (PPL officer, Sri Hardono, Bantul, 2006).
PPL would also hold the occasional course on new technological advancements. These were, however, only a fraction as common in comparison to the effort to teach the farmers about new seeds and how to use them (see, for example, Dinas 1984 or 1987) Instead, it was farmer-to-farmer relations which slowly spread the tractors. One farmer in Sri Hardono would work the fields in a neighbouring village using his buffalo. Another farmer would show him his tractor and let him have a try. Seeing the benefits from using a tractor, the farmer with the cattle and plough decided to purchase one himself (Farmer 1. Bantul, 2006). Mechanisation was thus achieved as a consequence of individual initiatives and only those who had the means and courage could do so. The state showed a lack of support as there was, in contrast to the schemes in modern biological and chemical modernisation, little support for purchasing tractors. This left the farmers with two options, purchasing it on credit from a bank or a tractor company, or paying cash. More often than not, the farmers refrained from running up a debt and instead sold something in order to finance the purchase (Farmer 1. Bantul, 2006).The farmers in Bantul thus needed to have certain assets or income in order to be able to mechanise disqualifying the vast majority of the population unable or unwilling to take such risks. Many farmers, when asked if they wanted a tractor, said they did but did not have the means. To buy one on credit was out of the question as they often felt unsure of their ability to repay the loans at a later date (see for example Farmer 2. Bantul, 2006). This is a classical case of how the farmers maximised their security rather than invest in expensive machinery.

A slight change in policy came about in the mid-1980s. This was the result of a presidential decree to stimulate mechanisation in Indonesia, in combination

with special aid from Taiwan and Japan. As a consequence there was a dramatic increase in the number of tractors from around twenty to about one hundred in just a few years (BPS, *Luas Penggunaan Tanah dan Alat Alat Pertanian*, various issues, Dinas 1986:136). This was also reflected in the tractor/land ratio, as seen in the table above.

In addition to new machinery, the extension system initiated a workshop scheme throughout Yogyakarta. The idea was that farmers could repair their tractors and other tools as well as buy or make spare parts. The workshops were also meant to function as forums where farmers could exchange experiences and modify the machinery to fit local conditions. These workshops were closely connected with the universities in Yogyakarta which sent students to help out (PPL officer, Sri Hardono, Bantul, 2006). There was also a scheme where farmer groups could buy a tractor from Dinas with no collateral, but one tractor shared among 80 farmers would simply not have been enough to provide for everybody's needs. What is more, there were only 25 of these in the whole of Bantul (PPL officer, Sri Hardono, Bantul, 2006). As a consequence, some rich farmers had their own tractors while a majority of the peasantry tells a story of long queues to using tractors from other villages. Another alternative was simply to use more traditional methods in preparing the land, e.g. using draught animals (PPL officer, Sri Hardono, Bantul, 2006).

Other important factors in the decision on what tools to use were personal relationships and lack of unbiased information. In areas where both draught animals and tractors were available, the farmers used tools provided by the agent who bought his produce. Besides, the farmers were given biased opinions on the use of tractors or beasts of burden by competing entrepreneurs (PPL officers Bantul 2004). Thus there was a lack of support for investments in tractors, making it an uncertain and risky business for anyone but the richer entrepreneurial farmers. Comparing Yogyakarta to the situation in other rice-producing countries in the region shows how low the level of mechanisation really was. In 1980 China had 18.8 tractors per thousand ha and Japan an incredible 414.6 in 1965 (Booth 1988:181). As seen below, a comparison is not really of any use as it only shows how far behind Yogyakarta was as late as 1996. For Java as a whole there were around 12 tractors per thousand hectares, substantially higher than in Yogyakarta, but not even close to international levels (FAO statistics).

4.2.2.2 Hullers and small rice milling units

As highlighted by Timmer in 1973, the introduction of hullers and small rice mills had a great effect on not only the productivity but also the quality of rice

(Timmer 1973; Timmer 1974). Traditionally the hulling or milling of rice had been carried out through manual pounding. The new machinery meant that this could be done faster and better. The new pieces of machinery were, however, far too expensive for most farmers. Instead, these hullers were purchased by either the richer farmers, or by a group of farmers. Other farmers could then use them for a small cost. A typical mill owner was a rich farmer, who also doubled as a rice merchant (Farmer 1. Gunung Kidul 2006 was one of those). He bought the rice grain from the farmer and milled it before selling it on. Alternatively a farmer could pay a small fee for having the rice milled and then sell it at the local market.

Rice mills were already set up in Yogyakarta at the beginning of the New Order regime. Most mills were located in smaller towns or commercial centres, but there were mills out in the villages too. In the 1970s there was an explosion in the number of mills and by the early 1980s almost every farmer used a mill. This meant that the effects on productivity that these may have had, primarily took place during that period, perhaps explaining the great increases during that time. By the end of the Suharto era, only the most exclusive type of rice was hand-pounded and this was done on an extremely small scale. In Bantul, the rice mills were adopted early on as it was more efficient to use them. In Gunung Kidul, on the other hand, it took a bit longer. Rice for other commercial use was not so common in Gunung Kidul and thus the need to mill it not as acute. In the wet rice producing areas of Gunung Kidul, the adaptation of the mill occurred at an earlier stage (PPL officer, Ponjong, Gunung Kidul, 2004; 2006)

There were no programmes from the state to help farmers with credits to enable them to invest in these machines. There were, however, other ways in which the state aided the farmers with the mills, predominantly through village cooperatives or the village groups which were helped to purchase the mills (PPL Bantul and Gunung Kidul 2004; Dinas various years).

4.2.2.3 Threshers and the ani-ani

Tractors and hullers were heavy and expensive tools but there were other activities in the cultivation process that could benefit from labour-saving technologies. In order to separate the grains from the stalks, rice has to be threshed. This was traditionally done by beating the sheaf on the ground or perhaps against a stone. This process was not only time consuming but also caused a great deal of the grains to split, thus decreasing the quality of the rice. Threshing could easily be done through the use of pedal threshers which, at a later stage, could be connected to an engine making them so-called power threshers.

The pedal threshers were introduced in Yogyakarta in the latter half of the 1970s. This was done partly by the extension officers but a much more important role was played by young students from Yogyakarta doing their mandatory community service.[13]The young students, in cooperation with the farmers, constructed these threshers to make them fit local conditions. The introduction of the threshers had a spillover effect as farmers from other villages saw them and wanted to try. The threshers were well received by most farmers but in Bantul, interestingly enough, most farmers only used them for a season or two before they were discarded. Instead, the farmers returned to more traditional methods of threshing, using a collapsible wooden contrapion. There were two principal reasons for the farmers not wanting to use the threshers. First, most of them were under the impression that the machinery was inefficient (Farmer 1. Bantul, 2006). It may have been faster but did not actually lower the costs for the farmers. That the old methods entailed greater waste, was not true, as the farmers generally did not sell their produce to dealers who required a high quality (Farmer 1. Bantul, 2006).

The second reason for not adopting pedal threshers was the labour agreement structure. The labour used in threshing was paid in kind, which was a portion of the rice stalks. These stalks were used for feeding cattle. One week the farmer would work in his field, the next in someone else's, distributing the stalks from all the fields among all landed, as well as landless, farmers. Abandoning this arrangement would have deprived farmers of an important additional income from cattle breeding (Farmer 1. Bantul, 2006; Farmer 3. Bantul, 2006). As with the case with tractors, the extension officers did not force the new threshers onto the farmers. In Bantul the extension officers held demonstrations and informed the farmers of the benefits of pedal threshers. Despite the lukewarm reception from the farmers, the officers did little to stimulate adoption. This lack of interest in the thresher is reflected in the quantity of them in Bantul. There was a gradual increase throughout the 1980s but still on a very low level, and in 1997 there were only 297 in the whole regency (BPS, *Luas Penggunaan Tanah dan Alat Alat Pertanian*, various issues; Dinas 1990-97).

In Gunung Kidul, on the other hand, the pedal threshers were very successfully implemented, increasing from only a few in the beginning of the

[13] Building on the original idea of the Bimas programmes, in which graduate students went to villages and worked in cooperation with farmers to introduce new agricultural practices. All university students in Indonesia had to do development work as a part of their degree. The students drew on expertise from their field of study and helped in developing society. This could take the form of building a thresher but could also be other things, such as teaching. The students had to finance their projects themselves.

1980s to over 6000 by the end of the Suharto regime (Dinas 1973; 1996). The interest from the farmers was not very high at first, but when it became clear that the machine could be used for a variety of crops, it caught on. As a result, it was used for threshing rice in Gunung Kidul, but was much more important in soybean production (Farmer 1. Gunung Kidul, 2006; Farmer 2. Gunung Kidul, 2006). Even if they were relatively cheap to produce, not everyone had one. The richer farmers owned them and the poorer ones would go to them for assistance or simply thresh in the old fashioned way. The introduction of threshers seems to have occurred in a similar fashion to that of Bantul with the difference that the extension officers were not involved in the process. Instead, the tools spread from farmer to farmer or with the help of students from the universities. A possible explanation for the success of the threshers in Gunung Kidul is that rice was not the principal crop where they were used, and thus the issue of the distribution of stalks after harvest was not important.

To conclude, there was a wider spread of threshers than tractors. This may most likely be explained by implementation costs. It was a straightforward and cheap process, which meant it was not too risky. As had been the case in the introduction of tractors, it was evident that the state gave little or no support in the implementation process. The extension officers were interested in the mechanisation, but did not try very hard to make the farmers use the threshers. It is also interesting to note that even though statistics show a great upsurge in the number of threshers in the area, evidence from Bantul suggests that a great many of these threshers were not used for a very long time, which indicates that the actual level of mechanised threshing in the area was much lower than the numbers tell us (Farmer 1. Bantul, 2006).

When looking at Java as a whole the development seems to have been very much the same as for Yogyakarta. The number of threshers in use increased from 2.83 per thousand hectares of paddy rice in 1981 to 15.62 in 1988. This increase came predominantly between 1981 and 1985. In the following years this increase slowed down, although it was still strong. While the increase in threshers is rather impressive it was, as in the case with tractors, gloomier when looking from an international perspective (Booth 1988, table 5.22; Naylor 1992:80-81). The level of mechanisation was simply too low.

One of the biggest changes that occurred in Javanese agriculture was the switch from the ani-ani knife to the sickle. The ani-ani is a small blade used by women when harvesting rice. The women would cut each stalk individually as the cutting of several stalks at a time would anger the rice spirits. The use of the knife meant that harvesting was an incredibly labour-consuming activity with up to a hundred women working in one field at the same time (Keyfitz 1985: 701).

With the new high-yielding varieties, the ani-ani knife was gradually replaced by the sickle, significantly reducing the number of workers required. In Yogyakarta this process took place early on in the green revolution and predominantly in the latter part of the 1970s (Dinas 1970-1979 various issues). Despite this, the ani-ani could still be found in some villages well into the 1980s but had long lost its significance. It was then used by the poorer farmers who still grew traditional rice types (Dinas 1980; Dinas 1986). As this change happened in the 1970s, this introduction of a new tool had a great impact in the earlier stages.

4.5.2 Summary

To conclude, labour productivity, as with yields, in Java and Yogyakarta increased dramatically during the course of the Suharto regime. Looking closer at the development, however, shows that most of the development occurred during the late 1970s and early 1980s. Thereafter Java still experienced an increase, but at a much slower pace. In Yogyakarta, on the other hand, development was much less marked and did not gain momentum until the early 1990s. In addition, although labour productivity increased, it was not at the same level as yields at the time.

The reason for this course of events was the lack of interest shown by the state in mechanising and modernising tools for farming. This meant that there were few subsidies or credits for the farmers interested in mechanisation. With this lack of support, mechanisation was achieved by private initiatives from the farmers and, as a consequence, only the richest or bravest farmers could implement the new technologies, leading to a slow implementation of, for example, tractors. The mechanisation that took place during the New Order was not forced like it had been with the introduction of biological and chemical inputs. The farmers were basically left to choose, resulting in security being prioritised among the poorer farmers, and the same momentum, that had been built around the intensification programmes, never materialised. This was perhaps not a very surprising path in the initial development project in Indonesia as land was scarce and labour was abundant. As has been highlighted by Oshima, however, the transformation from a labour-intense to a mechanised agricultural sector was equally important for the success in East Asia. That labour productivity and mechanisation stagnated, after an initial surge, was of great concern in the Javanese case.

4.3 Conclusion

There is no doubt that cultivation in Java and Yogyakarta went through major changes during the course of the Suharto regime. Productivity, in terms of returns to both land and labour, increased significantly. In fact, the process could even be dubbed a remarkable success as the country achieved self-sufficiency in rice. Examining the development somewhat closer, it is possible to discern some of the problematic issues in the success story. While productivity and production increased drastically in the last years of the 1970s and early 1980s, there seems to have been a slowdown on Java in the 1980s, a trend that was not broken until the early 1990s. Although the pattern is seen in both yields and labour productivity, it is most apparent in the returns per worker. Looking at Yogyakarta more specifically, the region followed the trend of Java in terms of yields, but the returns to labour were more or less static from the early days of the regime until the last years before Suharto's fall from power. The bulk of the agricultural transformation in Java thus took place in the first half of the Suharto regime, and it could be argued that the regime successfully achieved the first phase of intensification. The question is why the development process, that looked so promising, stalled? Looking at the driving forces in Javanese agriculture, it is clear that the primus motor was the state, which very much dictated the general direction of the agricultural transformation. This was done through skewing input and output prices, thus creating incentive for the farmers. In addition, the extension system through Dinas and Bimas, created a support network which, although aiding the farmers, also worked as a powerful force of coercion.

The majority of the farmers, on the other hand, as Scott argues, cared more for security than profit and risky modernisation. The incentives created by the state through subsidies made technological advances more of an option. In addition, the state did not allow any farmer to fall behind in its development project and so those who, despite promises of great profits at lower risk, refused change were forced to join the ranks. Furthermore, the farmers, bar the elite, had little resources to invest in new technology, and so the state could be the only motor for change. What we see in Java is thus a case of state-led innovation which counteracted the conservative and hesitant farmers. As the state was the force of change, its policy needed to be more carefully examined.

The most apparent characteristic of the development policy was a heavy bias towards chemical and biological advances. This bias is not very surprising as Java was labour abundant but poor in land. Land-augmenting policies were thus a cheap and quick way to increase production. That the technological

advances entailed higher labour intensity was not a problem, but rather, as has been argued by Oshima, a good alternative for the under-employed. Thus in the 1970s and early 1980s it made sense for the state to encourage the farmers to adopt these new technologies, replacing the relatively scarce factor of land. By doing this, the country managed to achieve self-sufficiency in rice by 1985. The crux of the matter, however, was to continue the process and move towards the next phase of agricultural transformation. The goals of the green revolution had been met, but in the 'East Asian Model' of development the next phase was equally important, namely to move towards a more labour-productive agricultural sector which could stand on its own two feet and work as an engine for growth (Adelman 1984; Oshima 1986). Looking at Java and Yogyakarta in particular, it is evident that this change seems to have been present in the late 1970s and early 1980s, but then it trailed off. The stalling of the process was a result of a few of things. First, as with land-augmenting technologies, the farmers did not adopt them unless it was safe or some other force directed them. While state policy had forcefully pushed for land-augmenting technologies, the farmers were presented with few subsidies or special schemes to make them adopt new technology. If the farmers wanted to use new machinery, they had to do so following their own initiative. Mechanisation would thus have meant higher risks and could not be afforded by the majority of farmers. As a consequence, the increased productivity of labour and growth in the use of machinery was the result of a small group of farmers moving forward with labour-productivity increasing measures. These farmers were thus the driving force behind the transformation. The majority of the farmers, however, functioned as an obstacle to the process. As the state did not help the entrepreneurial farmers, the state may be said to have been an obstruction to continued progress.

That the poor farmers acted in this manner is perhaps not surprising, but the motives of the state are less clear. The answer can be found in the urban bias in state policy. In 1984, Indonesia achieved self-sufficiency in rice, which was the primary target of the green revolution. The needs of the growing population had been met and Suharto, who had almost been toppled from power in the early 1970s as a result of failing to provide the urban population with enough rice, was safe. Rice had become politics and the dominant forces were found in the cities. The increase in production, although benefiting the rural population, was not directed at them. Increased labour-intense production also meant that a large proportion of the population remained in rural areas, without threatening the urban way of life. The regime could have, with the support of Geertz, argued that the farmers lived in an involuted society and were not prone to change. Yet

the farmers showed that it was quite the contrary, but that they needed help from the state to carry out the modernisation of their cultivation practices. Instead, the state went from being a driving force to being a burden.

The result was that yields were internationally top class but labour productivity was trailing behind significantly. The development project of Indonesia and thereby Java, despite achieving self-sufficiency, was thus far from done in the mid-1980s. Yet, the efforts seem to have trailed off. It could be argued that the paramount interest of the regime was precisely to feed the growing population, and when that was achieved the programmes had fulfilled their purpose. This policy also had other implications, e.g. production increased but labour productivity did not. There were few economic benefits for the rural population in the modernisation process, as discussed in the next chapter.

Chapter 5

Income in Javanese Agriculture Under Suharto

5.1 Introduction

It has been shown above that the production of rice increased dramatically in the 35-year-long Suharto regime. The great increase in rice production and achieving rice self sufficiency meant that the people in Java and Yogyakarta were no longer in immediate danger of the starvation that had loomed as a threat throughout the Sukarno regime, due to a constantly decreasing availability of rice per capita (Penny 1968:73). There is evidence that in the course of the Suharto regime the number of people living in poverty, both in relative and absolute terms, decreased steadily (Hill 2000).[14] Although the Suharto regime had been successful, the effects of the economic crisis in 1997 indicate weaknesses of the poverty reduction schemes in place under the Suharto era. Over night, poverty incidence rose dramatically (Maksum 2004:6). This sudden increase does not, of course, imply that people went from being affluent to poor but rather indicates that poverty reduction in rural Java still left people very close to the poverty line, making them insecure and vulnerable in the face of crisis. In addition, post-crisis data show that the severity of poverty and the poverty gap in Indonesia were aggravated more in rural than in urban areas (Maksum 2004: 8-9). This shows not only a widening gap between the sectors but also the inability of agriculture to bounce back. This means that although the majority of the population had increased their income and security, a considerable proportion of the rural population must have been very close to the poverty line when the crisis hit. This makes it very important to examine how average income and distribution changed over time. Did the increase of production automatically lead to sustained income growth during the Suharto regime or was it, as Geertz argued, just a continuous case of high level

[14] When measuring the population under the poverty line there is, however, a big, problem with the indices used in Indonesia. First, in the basket used by the Central Bureau of Statistics, rice is the most important commodity. The steady decrease in the rice price relative to other basic needs thus lead to a more positive picture than was perhaps accurate. This was even more apparent in the index created by Sajogyo, which was based on just rice (Booth 1992:344-345). Whatever the problems with the different measurements, Indonesia had arguably battled poverty successfully (Maksum 2004:6).

equilibrium? Increased production did not create a greater surplus for the farmer since more people were working the fields and sharing the profits (Geertz 1963).

This thesis has already shown that yields increased and labour productivity showed advances in Suharto's Indonesia. This indicates that if there had ever been a vicious 'involuted' cycle, as Geertz argued, the modernisation process of the 1970s had definitely broken it. In addition, an increase in productivity, particularly in returns to labour, does create a surplus and should thus be reflected in agricultural income. At the same time it is important to remember that although there were advances in labour productivity, they were largely confined to a few years of development and the rates of change were much slower at the end of the period.

The aim of this chapter is to give an overview of agricultural income, how development policies affected this in the course of the New Order and what impact the increase in production and productivity had on incomes. It will be argued that although incomes rose during the Suharto regime, it was more important to increase production volumes, which is reflected not only in the slowing down in real income from rice, the main crop for smallholding farmers, but also in the lack of interest from the state in diversification into other more profitable crops for the farmer. This is also evident in the sugar policy pursued. It will also be pointed out that this is a case of urban bias as the principal goal of the state was to cater for the needs of the urban population.

In addition, it has often been claimed that the farmers were adverse to change, and as a consequence, do not shift to other crops voluntarily. Here it is shown that, on the contrary, the farmers were interested in other crops if they got the chance to earn high incomes.

5.1.1 Focusing on agricultural income

In rural Java income has historically been derived from both on- and off-farm activities. Throughout the New Order regime, off-farm activities played an increasingly important role for the farmers' income (Booth 2004:17). Despite this, more than half of rural households in Java were dependent on agriculture alone in 1995. In addition, another 20 per cent derived part of their income from the sector. Yogyakarta mirrored this picture to a great extent (Booth 2004:17, 32). Income changes in the agricultural sector were therefore very much a determinant of the level of income as a whole for the rural household.

This chapter will focus on the development of income in the food crop sector in Java in general, and particularly in Yogyakarta. It is important to look

at the income of the landowners and, as there was an increasingly large number of landless labourers, the changes in rural real wages.

In addition, we look into the effects of 'rice is policy' versus 'crop diversification'. Finally, we examine what role the sugar industry had in Yogyakarta. To study the sugar industry in greater detail may seem a bit odd, but the fact is that the sector is interesting in this context for a number of reasons. The sector, along with Bimas and other parts of the extension system, was directly under the government. The policies on sugar were thus very closely intertwined with the rest of the agricultural development project (Mundy 1992:24). Moreover, sugar was, under Suharto, one of the most important cash crops in Bantul. The sugar industry thus gives an indication as to how devoted the Suharto regime was to improving the farmers' income.

5.2 Income from agriculture

This section will focus on the two groups in Javanese agriculture as discussed above, namely smallholders and landless labourers. The vast majority of farmers in Java cultivate their own land, but there is, and has always been, a large group of landless labourers. As this group is very large, and growing, it warrants a separate discussion.

5.2.1 The smallholders' income[15]

Rice is by far the most important crop to farmers as it takes up a large part of their fields and time. Furthermore, as was evident in the previous chapter, state policy emphasised the expansion of the area under rice, thus making it very difficult on the farmers' part to make major changes in their choice of crops. The implication of this lack of choice will be discussed in greater detail below. Here, it suffices to say that, whether the farmers liked it or not, changes in income from rice had a substantial impact on the farmers' total income. Rice is, however, by no means the only important crop for the farmers.

The cropping pattern in Java as a whole, and in Yogyakarta in particular, under Suharto, consisted of several rice seasons, but the number of seasons varied over the years. In some well irrigated areas three crops were possible but in other drier parts no more than one was feasible. In addition, in some areas the

[15] This section is based on formal interviews and informal conversations with farmers and PPL officers in Bantul and Gunung Kidul.

short time between rice crops led to greater vulnerability to pests and the farmers were forced to have fewer seasons for that reason.

In general two seasons for rice was the norm (PPL officers, Bantul, 2004). Between the rice harvests the farmers grew secondary dry crops, *palawija.* This secondary crop consisted of non-rice-cereals, like maize, and different types of groundnuts as well as cassava and sweet potatoes (PPL officers, Bantul, 2004). Alternating between rice and secondary crops was an ancient system which the farmers were more or less locked into, and as long as rice was the dominant crop, *palawija* was the other side of the coin and played an important role in the farmers' income. As a consequence, the farmers' income from these crops will be reviewed.

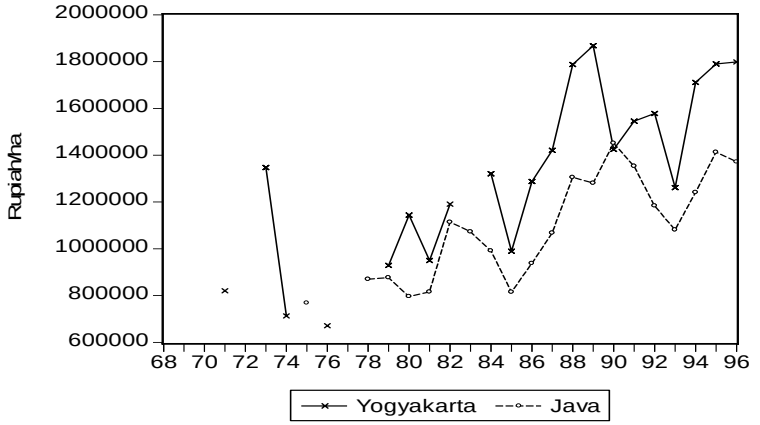
Finally, there were other crops such as fruits and vegetables. These played a secondary role but will be discussed all the same. This section will be concluded with a short overview of the farmers' terms of trade, giving an indication of the farmers' income with all the different crops combined.

5.2.1.1 The income from rice

The goal of the Ministry of Agriculture had been twofold, to increase the production of rice and to improve the standard of living for the farmers. This was to be achieved by increasing yields (Dinas various years). For this study, there is, unfortunately, no data for income from rice before 1975. As seen in chapter four, the development of production and productivity was similar to that of Yogyakarta under the Bimas programme, and it is therefore fair to assume that income from rice changed in a comparable pattern in Java, as a whole, as well. This leads to the assumption that real income from rice declined before 1975. Thereafter, it started to increase, but only moderately. That income from rice had a detrimental effect on farmers' incomes is evident when turning to the problems faced by the intensification programmes. There was a steady decline in the number of farmers who joined up. One reason could have been that, after a few years in intensification programmes, they were better off and did not need more credit from Bimas. Another much more likely explanation may be traced to the high default rate of the Bimas loans. In 1976 the default rate was 16 percent but increased to 36 percent only four years later (Sajogyo and Wiradi 1985:17). The subsidised state credit was eventually abandoned for a more general purpose programme which left it up to farmers to decide how to use the funds. Important to note, however, was that neither programme was particularly successful (Booth 1988:152-153).

Returning to the years with available data, it is evident from figure 5.2.2 below that there was a sharp increase in rice income at the time of the Insus

Figure 5.2.2 Income from rice in Java and Yogyakarta 1969-1996



Note: The data gathered from Dinas pertanian relates to yearly income per hectare. These figures have been deflated using the World Bank CPI (base year 1995). In the case of Yogyakarta, two sources have been combined. This was not a problem as the figures in the latter half of the Suharto regime were the same in both sources.
Source: BPS, S*tatistical Year Book of Indonesia*, various issues; Dinas various years 1970-1996; BPS, *Struktur Ongkos Usaha Tani*, various issues

programmes. This increase was, however, soon gone and the farmers were back to mid-1970 levels. There was also a rise in rice earnings from the mid-1980s and it is fair to assume that this was closely related to increasing mechanisation and thereby increased labour productivity which occurred during this time. The development gained momentum from the Supra Insus programme in the late 1980s. Shortly thereafter it was down again to the same level as in the early 1980s before recovering. This slump was explained by decreasing subsidies, which in turn meant higher production costs (Pusri 2001).

To conclude, it seems as if income had a positive, although volatile, development until 1988. After a big increase in the mid-1980s, however, income growth slowed down. This indicates that as the regime moved on, income from rice became less important.

This trend was also present in Yogyakarta. From the figure above it is evident that as the Bimas programmes gained momentum after the rice crisis of 1972, real income from rice deteriorated. The negative trend was thwarted in

1976 and as the Insus programmes took off, so did income from rice which more than double between 1976 and 1984. After this fantastic increase there was a slump for a couple of years, which was followed by a few more years of dramatic increase, although not at the same level as before. In the late 1980s the increase was abruptly broken and did not return to the same levels until the very last years of the Suharto regime. The development in the 1970s was perhaps not surprising, as production and yields per hectare, after an initial upsurge, actually decreased during the mid-1970s. It is also an indication of the cost of new inputs in production. New fertilisers, pesticides and high yielding varieties may have increased production but they also, despite large subsidies, raised costs. As yields did not increase particularly as a consequence of pests and drought, the farmers were left with increased costs but not much more in their pockets. The increased costs may also help to explain why the Supra Insus programme only had a brief impact on income. The profits were eaten up by increased production costs (*Struktur Ongkos Usaha Tani* 1990, Farmer 5. Bantul, 2006). Perhaps more crucial was the increased labour demand that the new seeds created. In chapter four it was shown that increases in labour productivity occurred primarily under the Insus programmes. The goal of the regime was to provide work opportunities and as there really was only one sector capable of absorbing labour on a large scale, it meant that agriculture had to serve as the vent for a growing labour force. In addition, the new rice types were highly vulnerable to pests and while there was some help in battling these, there was no financial support for those who had been affected. This resulted in farmers paying increased costs, often on credit, only to see it all go up in smoke.

That the farmers' income was undermined is evident when looking at the expansion of the intensification programmes which slowed down in this period (Dinas 1980-1983). This slowdown in the mid-1980s was due to two main factors. First, there was a high default rate on the loans taken in the Bimas programmes, which meant that a growing number of farmers were not eligible for new loans and could not continue in the programmes (Dinas 1980-1983). Furthermore, there were also those who had not defaulted but had already taken big loans and could therefore not take any more (Dinas 1980-1983).

The second reason why some farmers showed little interest in credit was that they deemed it too risky. Many of them argued that they could not take any credit as it was too risky in the sense that they were afraid of not being able to repay their loans. A common argument was that the farmer would, of course, have loved to take a loan, but if something had gone wrong in the next few years, say a bad harvest. It would then not have been possible to pay back (see for example Farmer 3 Bantul, 2006, Farmer 1. Gunung Kidul, 2006).

The big increase in real income from rice from the late 1980s came with the last intensification programme, Supra Insus. The farmers had at that time become used to adopting new biological and chemical technology and this led to a quick increase. At the same time, however, subsidies on fertilisers decreased, which led to increased production costs (Pusri 2001; BPS, *Struktur Ongkos Usaha Tani* 1989-91). Despite the increases in costs in the late 1980s, the extension system pressed forward advising, farmers to use more fertiliser. Farmers tell stories about how they had to start using a new type of tablet fertiliser. They were not happy about this as it increased their costs more than they would have liked, but the PPL officers did not reflect on this as it was to increase production (Farmer1. Bantul, 2006)[16]. This is a clear cut case of how the policy was not really directed towards increasing the farmers' income, but rather to ensure a food supply. Rice had become politics in Suharto's Indonesia, with the urban elite and the students threatening to topple him if he did not provide food. The emphasis on a low rice price could be interpreted as the result of an urban biased policy (Bresnan 1993:115).

The end result of the regime pricing policy is not surprising since, from 1984 and onwards, the farm gate prices on rice deviated more and more from the floor price set up by the government (Booth 1988:154). In addition, the real price of a kilo of rice steadily declined throughout the Suharto regime. This reflects the fact that rice could not keep up with the price of other commodities and the farmers' purchasing power was undermined (Roche 1994:60). The reason for the big increase in income was thus an effect of increased yields rather than increased prices.

5.2.1.2 Secondary crops, vegetables and fruits in Yogyakarta

Income in the rice sector in Yogyakarta thus showed an impressive development, but most of the increase occurred during the middle phase of the development programmes, the Insus. Turning to the secondary crops, these showed a similar trend. There are no figures for the 1970s but it is evident that real incomes from maize, groundnuts, soybeans and cassava were on a low level. From the early 1980s there was a trend of rapid changes in income. This change was strongest at the beginning of the 1980s, but thereafter there was little progress. In fact, the 1980s showed a very volatile development with great fluctuations from year to year. The real income from all but maize, while varying greatly, was roughly on the same level in the closing years of the

[16] Today, farmer 1 uses the tablet fertiliser and he sees the merits but back then it was not a choice he would have made (Farmer 1. Bantul, 2006).

Table 5.2. Income from rice and vegetables per hectare, (nominal Rupiah)

	1980	1986	1991	1996
Rice	228,181	451,776	966,129	1,480,595
Chillies	465,630	766,500	1,686,417	5,623,150
Onions	n/a	1,068,750	2,035,726	4,238,000

Source: Dinas 1980, 1986, 1991, 1996

Suharto regime as it had been in the late 1970s. These secondary crops were grown in the rice fields when rice was not cultivated, and thus would have been as demanding on space as rice, thereby dominating the dry season.

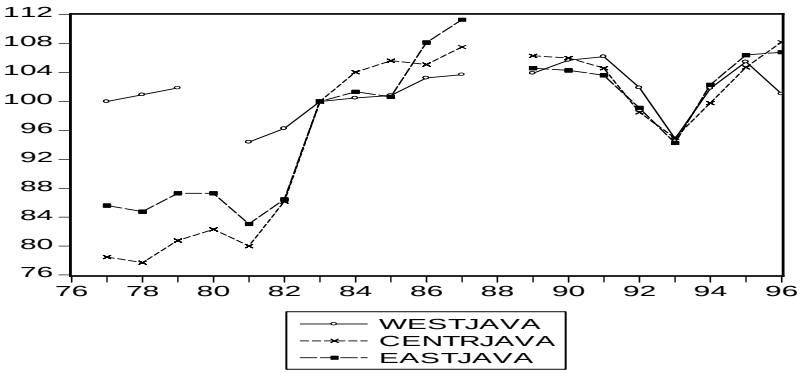
In addition to these crops, there were several other crops which played a minor role, and which did not belong to the same group of produce as wet rice and dry crops. Among these there were fruits, like mango, and vegetables, such as garlic, shallots and chillies (Dinas 1980, 1985, 1990). The farmers grew these on a much smaller scale, often in the back garden or in plots not used for anything else (See for example Farmer 5. Bantul, 2006). While rice and dry crops usually were sold to middlemen, the farmers could often sell these more valuable crops directly in the market in Yogyakarta, making a bigger profit for themselves (Farmer 5. Bantul, 2006). Fruit and vegetables were in stark contrast to rice and even more so in comparison with dry crops. As an example, the profits from growing chillies were double those of rice per hectare in 1980 (Dinas 1980). As seen in table 5.2 above, the margins had started to shrink by 1986 but were still more than a third higher (Dinas 1986). By the end of the Suharto regime, the difference had really increased as chillies then gave a profit almost four times as high as that for rice. This picture is much the same when looking at other vegetables.

5.2.1.3 Terms of trade

Turning to the farmers' terms of trade, the image, naturally, resembles that of the crops discussed above. The terms of trade are created using a composite index covering not only rice but also dry crops, vegetables, fruits and commercial cash crops. This gives a more complete view of the farmers' income from agriculture.

While there is no data on terms of trade for the whole island of Java, BPS provide series for each province in Java (BPS, *Statistical Yearbook of Indonesia*, various years). As seen in figure 5.2.1 a they all followed each other. Looking at the whole period, there was a dramatic increase in the terms of trade for the farmers but most of this increase occurred in the early 1980s. This is very much in accordance with the increase in real income from rice during this period. With

Figure 5.2.1(a) Terms of trade in Java 1977-1996(base 1983)



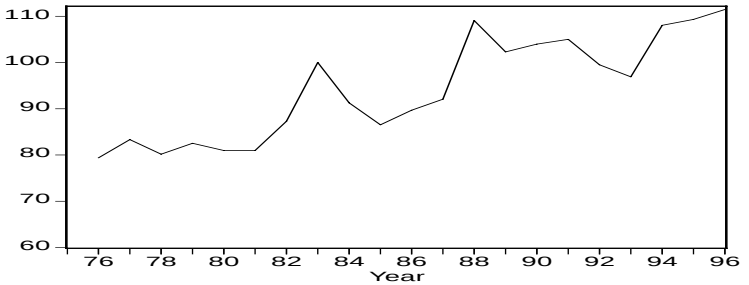
Source: BPS, *Statistical Year Book of Indonesia,* various issues

the exception of East Java, the rest of the 1980s was a stable period until a decline began in the early 1990s. It seems as if the big increase came at a time when Indonesia had yet to achieve self-sufficiency in rice. When this was achieved, the interest from the government waned. Another explanation was the decreasing oil price, which made it more difficult to carry out projects similar to the ones in the past (Hill 2000; Booth 1992). On a final note, however, it is important to remember that, as mentioned above, the rice price declined steadily throughout the 1980s.

Turning to Yogyakarta, there is only data on terms of trade for the region stretching back to 1976. In the 1960s the country was in dire straights and Sukarno suppressed the price of rice in an effort to lower the government wage bill (Bresnan 1993:115).[17] It is therefore likely that the terms of trade for the farmers did improve at the beginning of the 1970s and were definitely better than they had been in the 1960s. At first glance, it is evident that the farmers' terms of trade improved by about 35 per cent in 20 years. A closer scrutiny, however, shows that in Central and East Java there was, after a long static period, a substantial increase in the first couple of years of the 1980s. This surge was followed by another period of stagnation and, in the early 1990s, even a decline. In fact, by 1996 the farmers' terms of trade were just over ten per cent higher than in 1983, indicating a significant slowdown in the improvement

[17] Civil servants' wages were, under Sukarno, partially paid in rice(Bresnan 1993).

Figure 5.2.1 (b) Terms of trade in Yogyakarta 1976-1996(base 1983)



Source: BPS, *Statistical Year Book of Indonesia,* various issues

of the farmers' situation. This means that while terms of trade were substantially better for the farmers at the end of the Suharto regime, the major improvements had actually already occurred in the early 1980s when self-sufficiency had still not been achieved. In addition, it is interesting to note that the Bimas and Insus programmes seem to have had little or no effect on the terms of trade. These early projects thus, arguably, had little or no effect on the farmers' economic standing. Neither did the final big intensification effort of the Suharto regime, the Supra Insus programmes, which took place after 1987. Judging by the evidence above, the main reason for the big changes in the terms of trade may be attributed to crops other than rice or dry crops. This seems to have been confirmed by the income indices for vegetables and fruits, which showed big increases in these particular years (Dinas various years).

The farmers themselves tell a story which very much corroborates the aggregate terms of trade. The general view is that their income from agriculture increased gradually throughout the Suharto regime. At the same time, however, they stated that their costs increased. The cost of inputs in agriculture increased but still left them with a slightly higher income every year (Farmer 1. Bantul, 2006). The big problem, for the landholders, was not that they did not have enough to cover their food bill but that other costs increased more rapidly. Throughout this period it became increasingly more expensive to purchase clothes, cooking oil and other necessary goods (Farmer 1. Bantul, 2006). Furthermore, there were increasing social costs with rising school fees etc. In fact, when the children needed new books and new clothes or tuition fees had to be paid, the farmers often had to sell off some of their assets to finance the extra cost. In some cases the farmers had to work more or family members, who had

previously been at home, were forced to find employment (Farmer 5. Bantul, 2006).

The farmers' income from agriculture was dominated by traditional crops, (i.e. rice and dry crops) Income from these crops and particularly from rice increased throughout the Suharto regime. The big increase, however, came in the first half of the 1980s, and although there was an increase thereafter, it was much smaller. This was also reflected in the farmers' terms of trade which show a similar trend. In general it seems as if income from rice and dry crops could not keep up with price development in the economy as a whole, despite efforts from the state to improve agricultural standards of living as well as attempts to move the farmers away from the less profitable dry crops. These difficulties, of course, would also have been adversely affected by the gradual decline in subsidies, which occurred from the mid-1980s onwards (Pusri 2001).

While income from rice, compared to dry staple crops, was reasonably high, the big earners were fruit and vegetables. These crops were already highly profitable at the beginning of the Suharto regime and became increasingly so. Hence, an attempt to improve the farmers' terms of trade would have required more support for other crops. They were often more labour intensive than rice and would not have meant a risk of making the sector less capable of absorbing excess labour. As will be discussed below, rice played an important role in the survival strategy of the Suharto regime and although the greater emphasis on other, more profitable, crops would have meant an increase in income to the farmers, feeding the population on Javanese rice was the paramount goal (conversation with Parulia at IPB 2005). This emphasis on rice also meant a fortification of existing cropping cycles, automatically forcing the farmers to grow secondary crops in set seasons.

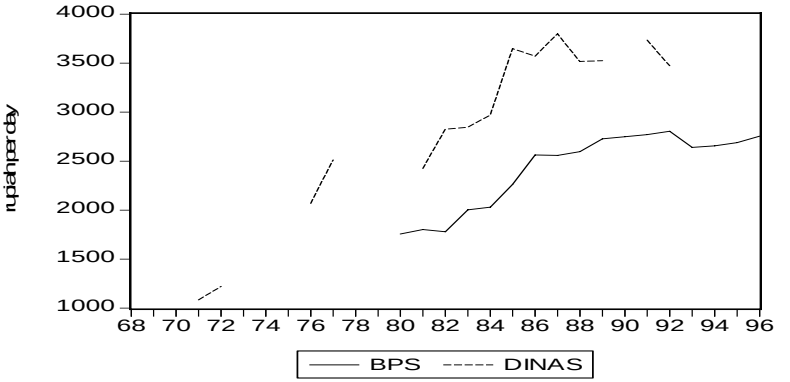
5.2.2. The landless farmhands' income

As clearly established above, the landed farmers saw their real income, from rice, increase particularly in the 1970s and early 1980s. The income changes, however, were volatile and had it not been for major increases in the 1990s it would have been an altogether sad story. Even though a majority of the rural population active in agriculture in Java and Yogyakarta had their own piece of land, a large proportion were landless and depended to a great degree on their income from working as agricultural labourers (Sensus Pertanian 1993). Since labourers were such a large proportion of the rural population, their wages constitute a very important factor when discussing changes in income for the agricultural sector as a whole.

Real wages in the agricultural sector had a positive development in Yogyakarta during the New Order. From the early 1970s to the end of the regime, day-labourers' income more than tripled. Examining the evidence closer, however, reveals that almost all of the increase occurred in the first fifteen years of the green revolution. The increase was in two stages, the first occurring at the same time as the green revolution gaining momentum and the need for labour increasing. The second increase started in 1982 and coincided with increasing growth in other sectors of the economy. After the surge in 1982, real income from agriculture levelled out. There are a number of ways to explain this. The easiest way is to look at it from a supply and demand perspective. With the green revolution there was a technologically driven increase in labour demand. By the end of the 1970s, however, there was an increase in mechanisation in agriculture. Technology would thus have dampened the wage rates. The second big hike in wages occurred at a time when oil prices started to turn downwards and Indonesia embarked on an export-oriented growth model, based on manufacturing industries. In addition, the service sector grew at a very high rate at this point. (Hill 2000). The landless labourers were in a situation where alternative occupations outside agriculture were a viable option. At the same time production in agriculture kept rising. At this point, demand in all sectors was increasing, the new sectors competed with the landholders over the labour resources and wages went up as a consequence. The marked slowing down in wages from 1985 and onwards may also be explained through supply and demand. The increase in rice production had eased off, the intensification programmes no longer had that strong an impact and technological advances were fewer. The demand for labour in the sector was thus more stable than before. At the same time, although mechanisation was not strong it was enough to offset the effects of the part of the labour force that did leave the sector as the demand in other sectors remained high (Hill 2000).

Another important explanation for the downturn after 1985 may be that Indonesia at this point had achieved self-sufficiency in rice and the agricultural sector had lost some of its importance. The government, therefore, did not pour the same amount of resources into the sector, thus decreasing the profit margin for the farmers and thereby the possibility of increasing wages. In this context the oil price was an important factor. With falling oil prices it was crucial to increase support for the light industrial sector as it had become the new engine of growth. Resources were then directed away from agriculture and into manufacturing industries, giving an indication of that the regime was not interested in an agriculturally driven economy.

Figure 5.2.2.Real wages in Yogyakarta 1971-1996



Note: The figure is based on an eight-hour working day. Furthermore, the income levels in the data from BPS and Dinas differ markedly but both show the same trend and in order to gain a better understanding, both have been included. Wages deflated with CPI (1995 base year)
Source: BPS, S*tatistik Upah Buruh Tani di Pedesaan 1980-1990*; BPS *Statistik Upah Buruh Tani di Pedesaan 1990-1996;* Dinas, various years.

In addition to this purely economic set of explanations, there are also other possible explanations. One important factor was that, though labour had not been paid in kind since the late 1970s, wages were still based on the rice price.[18] Generally this meant that the wage would be the equivalent of a kilo of rice (Farmer 2. Bantul, 2006; PPL officers Bantul and Gunung Kidul, 2006). With the rice price as the determinant, wages were naturally dampened as rice did not keep up with the price of other commodities (Roche 1994). Furthermore, there were other tasks, which cannot be seen in official statistics, that a day labourer had to do to secure employment with a landholder (Farmer Wonosari, Gunung Kidul, 2001). The labourer had to help repair a house or such like in order to keep the right to work the fields of the farmer. In reality the labourer worked more but was not paid for these extra hours.

Thus despite figure 5.2.2 above telling a positive story, wage labourers told a slightly different one, indicating that the increases may have made little difference to the farmers' standard of living (Farmer 4. Gunung Kidul, 2006).

[18] This is not entirely true, as labourers were paid in cash for the actual work, but were also at times offered a meal, or some cigarettes(PPL Gunung Kidul 2006).

In Gunung Kidul, the labourers seem to have been more at the mercy of the employer as it was more difficult to find employment elsewhere. There were some stone factories in the area and some construction projects (Farmer 4. Gunung Kidul, 2006). This was all well and good in the time of economic upsurge but life was very insecure. The picture for Gunung Kidul was a gloomy one; in Bantul, on the other hand, conditions were better. It was much easier finding work in other sectors of the economy. The farmers could always work as Pedicab drivers or in the construction or service sectors (Farmer 5. Bantul, 2006). Despite this, there seems to have been a certain degree of uncertainty as well, as the very same farmer said he was employed by a landholder out of pity (Farmer 5. Bantul, 2006).

Access to work in Yogyakarta was reflected in the farmers' attitude towards farm work, but still the bonds between labourer and employer seem to have been strong (Farmer 5. Bantul, 2006).

As for income from rice fields, the labourers, particularly in Gunung Kidul, were living close to the pain threshold. Even after the increase in real income, there were farmers who had to cut back severely in order to afford social costs such as school fees and clothes. While landed farmers could sell off a piece of land, or some other asset, they were forced to cut down on other types of consumption. A family would sometimes cut down on meat or eggs for the adults for a month in order to be able to pay for a wedding or school fees (Farmer 6. Gunung Kidul, 2006).

5.3 Rice policy and diversification

It is evident from the discussion above that both farmers' and day labourers' income, albeit irregularly, increased in the New Order. It is also clear that although rice was profitable in comparison to dry crops, vegetables and fruit were the big earners. One way of increasing the farmers' income from agriculture would have been to diversify cultivation into these other, more profitable, crops. Doing so would have also created a more dynamic agricultural sector contributing to the development efforts of Indonesia as a whole. It is therefore interesting to look closer at government efforts at crop diversification.

5.3.1 Diversification in Java in general

In short, there was no policy for diversification during the Sukarno era. The paramount goal was to achieve self-sufficiency in rice (Hill 2000). As discussed earlier, programmes to achieve self-sufficiency followed each other but with

little success. As the government failed to increase production enough, the population was asked to eat more maize and cassava, but there were no efforts to increase the production of these crops.

Although the programmes in place were directly aimed at rice, this did not mean that the farmers could grow other crops of their own accord. For example, the farmers were given fertilisers to improve rice production but, as a result of bad control mechanisms, they could use the new inputs for whatever crops they saw fit. There was, however, no intentional diversification policy (Booth 1988:147).

The situation was much the same in the early years of the Suharto regime, but, as the intensification programmes gained momentum, the control increased and farmers found fewer opportunities to grow anything that was not within the state led programmes (Booth 1988:148). Suharto had inherited a crippling economy with an agricultural sector finding it difficult to keep up with demand. Most of the rice was imported at a very high cost to both government and consumers. (Hill 2000:2-5). Since the ousting of Sukarno was closely related to the failure of the agricultural sector to provide the growing population with rice, this became the paramount goal for the new regime to survive, something Suharto became keenly aware of in the aftermath of the rice crisis in 1972.[19] Rice became a strategy of political survival (Bresnan 1993:119). When the second development plan took effect in 1974 there was a slight change in direction. In this plan, self-sufficiency in rice was changed to one for food in general. It had become apparent that as all emphasis had been on rice, other crops had suffered from lack of attention (Mears 1984:129). With rice production stagnating, it was necessary to strengthen other crops to increase security. Despite this apparent change in declared policy there was little evidence of a change in practice. On a national level, rice production increased by 17 per cent during the development plan while secondary crops, peanuts being the exception, either stagnated or remained at the same level (Mears 1984:129-130). That production did not increase so much was perhaps not surprising, as the area under dry crops actually decreased in relation to that of rice (BPS, *Yogyakarta in Figures*, various issues). During the third plan, Indonesia actually achieved self-sufficiency in rice (Sidik 2004:3). This was not the case for other food crops which continued to stagnate in relation to rice. As

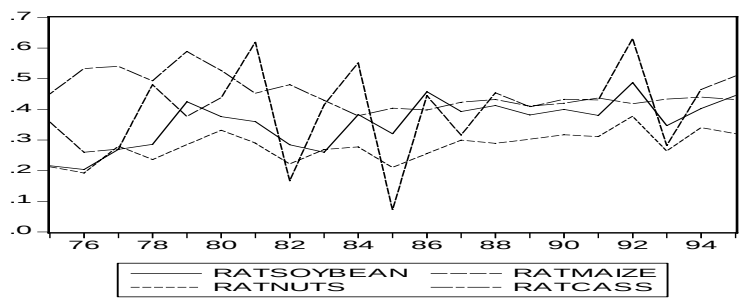
[19] There was an extreme shortage of rice in Indonesia in the seasons of 1972/73. The shortage was the consequence of extreme weather conditions and the inefficiency of the rice extension system, which responded too late to a looming catastrophe. In addition, world rice crops were lower than usual and the state found out just how vulnerable it was. Shortages and high prices gave the regime's critics ammunition and the very people who helped Suharto rise to power in the 1960s took to the streets, threatening his position (Bresnan 1993).

rice prices were experiencing a declining trend on the international markets and the productivity of rice was not going anywhere fast, the regime decided to embark on a more ambitious development scheme for other crops. Unfortunately, the scheme coincided with a downturn in the economy, not allowing for any great subsidies other than protection from international trade (Tabor 1992:187). According to Tabor, this policy did not lead to an increase in production as new fields assigned to, for example soybean, were ill-suited for this cultivation. Looking closer at the different crops, it is clear that one of the few successful crops was maize. Productivity increases had been achieved through the introduction of new varieties, which led to increases in production (Tabor 1992:187). To conclude, there were efforts to increase the production of dry crops in Java. Production did increase but not at the same rate as rice, although there were some crops like maize that stood out. The projects seem to have been somewhat half-hearted and the secondary food crops, in stark contrast to the rice sector, received very little support (Tabor 1992:188).

5.3.2 Diversification in Yogyakarta

The commitment to increase crops other than rice was not very strong on a national level. Yogyakarta largely mirrored the national view. There were four main dry crops in Yogyakarta, maize, cassava, soybean and groundnuts. Together these crops covered an area larger than rice but individually they were much smaller. Furthermore, the area under the aforementioned crops differed greatly, maize and soybean being the largest. For a better understanding, these crops are discussed in relation to rice.

Figure 5.3.2 (a) Area under dry crops in relation to rice in Yogyakarta

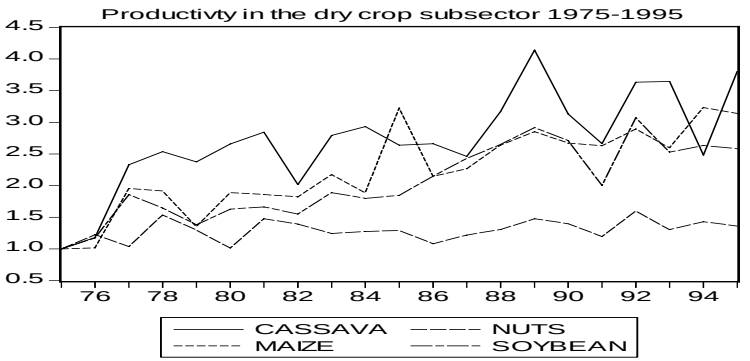


Source: *Yogyakarta in Figures*, various issues

At first glance it is obvious from the figure above, which shows the area under dry crops in relation to rice, that the road towards a more diversified agricultural sector was a rocky one. With the exception of cassava, the area cultivated under secondary crops increased substantially in relation to rice after the change in policy on food self sufficiency in 1974. It is interesting to note, though, that the big increase in land used for crops other than rice occurred in the early period, during the late 1970s. Thereafter little new land was claimed for these crops. Despite the government's slight change in direction on the rice issue, it seems as if it had difficulties realising its plans. Increasing production did not only have to be achieved through extensive methods, but could also be achieved through yield-increasing methods. Increasing productivity in the sub-sector could thus easily be achieved without intruding on land used for rice cultivation. As a consequence, it became important to increase yields per hectare. Looking over the whole period when these crops were included in Indonesian programmes for self sufficiency, it is clear that all four crops made significant improvements in productivity (BPS, *Yogyakarta in Figures*, various issues). There are, however, some interesting issues worth highlighting. First, there seems to have been an initial surge in productivity. After the increase the development was more gradual, until another increase in productivity took place in the latter half of the 1980s. The spurt in the late 1970s came at a time when there was little or no interest from the extension system to improve these crops. Once the intensification programmes were in place, the sector actually experienced a slowing down in productivity. This suggests that the efforts made to include these crops in the intensification programmes were not very efficient. This slowdown also shows that, compared to the increase at the beginning of the later intensification programmes, increases were on a much smaller scale. It is evident that it was in this period, when farmers were freer, that the agricultural system was dynamic.

Finally, the most lucrative crop, peanuts, was the exception. Not only was productivity more stable but development was far slower than for the other crops. In addition, while the productivity of other dry crops increased again in the latter half of the Suharto era, peanut cultivation was more or less on the same level.

Figure 5.3.2 (b) Productivity in secondary dry crops 1975-1995(base 1975)



Source: BPS, *Yogyakarta in Figures*, various issues

In the first years of the Suharto regime, focus was on reconstruction and damage control rather than developing any crops. From the agricultural policy reports of the extension services, it is clear that there was little or no interest in intensification of crops, other than rice, until the second development plan introduced the more extensive definition of self-sufficiency (Dinas 1969-1973). In 1974, there was a change in focus and the importance of promoting development through the use of new crops other than rice was stressed (Dinas 1974). Notwithstanding this shift, there is little evidence of the government putting words into action. In 1974 there were only 840 hectares for maize compared to the 71000 for rice. Other dry crops were given even less attention. That the area was not larger was, according to Dinas, due to a bad season with too little rain. As the areas suitable for dry crops and vegetables were so small, the farmers did not bother about investing in additional resources for these crops. Instead, they used some of the fertiliser intended for rice for these crops (Dinas 1975:453). The farmers thus did as they pleased. This showed that the farmers were not negatively disposed to growing crops other than rice using new cultivation practices, but were not willing to increase their expenditure without a certain return. While it started on a small level, one expects it to have increased over time as efforts became more effective. The small areas of land covered by the new intensification programmes showed a lack of dedication to increasing production other than rice. This was also evident in the lack of supply of high quality seeds. The research stations did not keep up with the demand for these new varieties and the farmers were forced to grow their own supply, which led

to an inferior quality in seeds (Dinas1976-1996). Another indication of the distinction between rice and dry crops was seen in the type of intensification programmes which included the dry crops. Only a fraction of dry crops were included during the Bimas programmes. Instead, these crops were a part of the Inmas programmes which, although offering support and a logistic network in order to facilitate higher yields, offered no credit scheme for the farmers (Dinas 1974 to 1981). When the Insus programmes were introduced in Yogyakarta in the late 1970s, they were exclusively for rice. Gradually, a large part of the dry crops was included in the Bimas programme but Inmas still played a dominant part. Hence, every cost had to be carried by the farmer, thus making it more important to cut corners and not invest in high yielding varieties and fertilisers, which increased costs as well as risks.

This lack of interest in dry crops changed in the first half of the 1980s when the area under intensification gradually increased until most of the area under dry crops was included in intensification programmes of some sort. The programmes covered a multitude of dry crops but four crops dominated.

While there was an improvement in dry land included in intensification programmes, most of the land was still under programmes which did not include credits (Dinas 1984:62; Dinas 1986:122). In fact, secondary crops were given a role of second best, and never included in the latest intensification programme. This was apparent in the 1970s and continued to be evident in the late 1980s when the Insus programmes were complemented with Supra Insus in order to thwart the slowing down in rice production. These efforts were solely directed at rice while other crops were confined to the older programmes. Much like when Insus was introduced, the dry crops were increasingly included in the Supra Insus programme. All the same, most of the area under dry crop cultivation remained within the no credit type of scheme. That there were no credit schemes from the government is an indication as to the level of importance these crops had. This is not to say that there was no available credit for the farmers. In fact, a majority of the farmers could use a credit system provided by private interests in order to finance modern inputs (see for example Farmer 3. Bantul, 2006). This was another indication that the farmers, given a chance, were quite willing to try new cultivation practices.

Another interesting aspect of the intensification programmes in Yogyakarta was their geographical distribution. In Bantul, in the wet lowlands of Yogyakarta, the intensification programmes for dry crops blatantly played a secondary role (Dinas 1973-1996). In Gunung Kidul, in the dry highlands, where rice was predominantly grown in one season in rain-fed fields, the dry crops played a much more important role. One reason for this may have been that dry crops

were more important in these areas, thus making it more urgent to improve the growing conditions for those crops. At the same time the rice production was predominantly for the farmers' own use, and the potential for crops to play an important role on the road towards self-sufficiency was slim. The area was not a wet rice area and thus played an inferior role. In Bantul, on the other hand, had wet rice with its great potential for improved yields, so other crops were seen as a threat to increasing production. Any resources used for dry crop cultivation in Bantul could also have been used for growing rice (Farmer 3. Bantul, 2006). The two crops were thus competing for resources to a much larger extent in Bantul than in Gunung Kidul.

5.3.2.1 New seeds, trials and demonstrations

From the discussion above it is clear that the dry area under intensification was initially small, but increased over time to cover an area much the same as the rice projects did. Looking at the area covered by intensification programmes, however, only tells part of the story. From chapter four it was clear that the intensification programmes came with more than just new agricultural inputs. There was also an extension network which provided support through courses, demonstrations of new cultivation practices and trials in order to adapt the new methods to local conditions. It is therefore crucial to study these aspects as well when assessing the intensification programmes for dry crops. The lack of interest in diversification in general in Yogyakarta during the 1970s was also reflected in the number of demonstrations and trials of the modern cultivation practices (Dinas 1970s various issues). There were a number of projects carried out in the region, particularly in the late 1970s but, compared to efforts made to increase rice production, they were negligible (Dinas 1970s various issues). Initially, the aim of the projects was primarily concerned with protecting the dry land from pests and drought in order to increase production. In the early 1980s, when diversification began to pick up pace, demonstrations and trials started to be carried out on a more regular basis. These were aimed at adapting new technology to local conditions but also to show the farmers the benefits from using modern inputs (Dinas 1980-1985). As a consequence, there were several projects, annually, on how to optimally take advantage of fertilisers and pesticides in dry crop cultivation. These projects were carried out either by Dinas through the local extension system or by the private companies that produced the inputs (Dinas 1980-1985). These trials and demonstrations were carried out throughout the rest of the New Order, introducing new fertilisers as they were made available.

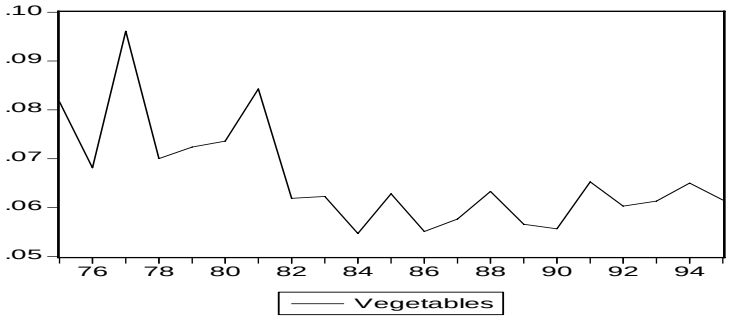
Genetically modified, high yielding varieties of maize, soy bean and other crops were also introduced to the farmers. While this may seem a success story comparable to that of rice, there were a number of problems which need to be considered. First, from a quantative perspective, there were trials and demonstrations, but these were dwarfed by the resources reserved for rice. Second, there was a conspicuous bias in the intensification schemes towards non-credit programmes. The farmers were generally forced to finance the change in cultivation either on their own or with the help of credits elsewhere. Third, and perhaps most important, were the difficulties in supplying farmers with new varieties needed for an increase in production (Dinas 1980-1985). This problem was already apparent in the late 1970s, and, although efforts were made to increase supply, it still covered no more than one fifth of the needs for dry crops at the end of the Suharto regime. While this was not a problem unique to the dry crops as it affected rice too, it was on a much grander scale and this, in combination with the lack of demonstrations and credit, most definitely had an impact on the adoption rate of the new varieties. By the end of the Suharto regime the area under the highest quality seeds covered no more than 70 per cent compared to rice which covered up to 90 per cent of the new crops. For wet rice alone, the figures would have been even higher (Dinas 1996). This also had an effect on the use of other inputs. Consistently, throughout the New Order, the farmers did not utilise the full quota of fertilisers given to dry crops (Dinas various years). This did not mean that farmers did not use fertilisers in dry crop cultivation, on the contrary, farmers used fertilisers, but from other sources where credits were available.

The profits from dry crops, nonetheless, were, with the exception of groundnuts, lower than for rice and would, in the long run, have had a detrimental effect on the farmers' income. It is also worth noting that the most profitable crop, peanuts, also experienced the slowest increase in productivity, while the relatively low income crop, cassava, enjoyed the best development in productivity. To conclude, the extension system in Yogyakarta did make an effort towards increasing productivity in dry crops, but the system was not given the same priority and resulted in lower efficiency.

5.3.3 Vegetables and the fruits sub-sector

As seen above the local extension system made a considerable effort to increase production using both extensive and intensive measures. These efforts, however, did not necessarily have a positive effect on the farmers' income as these crops, apart from peanuts, which had the least promising development, were not very

Figure 5.3.3 Area under vegetables in relation to rice



Source: BPS, *Yogyakarta in Figures*, various issues

big earners in comparison with rice (Dinas various years). As seen above, vegetables and fruits, on the other hand, were very profitable and an increase in production would, no doubt, have had a significant effect on farmers' income. In figure 5.3.3 it is clearly seen how the area under vegetables in relation to rice took up a negligible part of the arable land. This did not change throughout the New Order. In fact, looking at the whole period it is clear that, in comparison with rice, vegetables were grown in an area considerably smaller than rice. In addition, with the exception of a few years, these crops experienced a decline in importance until the end of the Suharto regime. The decrease came at the same time as it occurred in the dry crop sector, indicating that this was a time when rice expanded at the expense of all other crops. While the secondary crops recovered, vegetables did not.

Turning to the intensification programmes, vegetables were basically included in the same programmes as dry crops but on a much smaller scale. The start of the intensification of vegetables came with a slight change in direction in 1974 (Dinas 1974). Initially there were no efforts to include vegetables in the Bimas programme, but in 1975 two thousand hectares were under the Inmas programmes (Dinas 1975). Compared to over 100,000 hectares for rice, this was negligible but the area grew gradually over the years. In the mid 1980s, the area tripled and by the end of the Suharto regime the intensification programmes covered more or less all the area under vegetables (Dinas 1985; Dinas 1996). The increase was substantial but even so it was still on a very low level compared to other crops. There were lots of different vegetables but the most grown were chillies and shallots (Dinas 1996). These were included in the same projects as the dry crops, which meant that they were grown in a similar fashion

with the difference that new, higher yielding varieties were not introduced. As vegetables were a part of the intensification programmes, there were problems with a lack of seeds. There were several types of vegetables grown in Yogyakarta but here shallots and chillies will suffice to give an idea of productivity changes, and they were relatively more important than the others[20].

It is more complicated to establish the importance of fruits in comparison with other crops as they were generally quantified in plants rather than hectares. The fruits were not grown in the fields and thus did not compete for arable land with other crops. They were grown in spare areas such as garden plots, road curbs or alongside fields.[21] As with all crops, but rice, fruits were initially not even on the agenda for agricultural development. Gradually, however, efforts were made throughout the 1980s to increase the farmers' income from fruits. There were a number of projects carried out by the government and a few run on the initiative of international donors or aid organisations. The extension system in the early 1980s saw the introduction of seedbeds at village seedbed centres, which produced an assortment of fruit seeds for the farmers. Still, it was not until 1984 that major efforts were made to get the farmers to grow fruits within the so-called diversification programmes (Dinas 1984). These programmes included free seeds to the farmers so that they could start growing mango, rambutan and other fruits. The project expanded further throughout the 1980s and 1990s, including more crops such as grapes and oranges (Dinas 1990). The project developed in order to offer greater quantities of seeds to a larger number of villages. In addition, some of the fruit trees were attacked by pests. The local government helped to introduce a new more resistant tree while taking care of the old ones. This type of assistance seems to have been very rare (Dinas 1990s). There was also the occasional demonstration, but in general the model used for promoting fruits was to give the farmers the seeds and let them get on with it (Farmer 1. Bantul, 2006).

In the 1990s, agribusiness made its mark on Javanese agriculture and this also had implications in Yogyakarta where the farmers learnt how to not only market their products but to refine them in small enterprises. These were more directed at dry crops such as soybean, cassava and peanuts. The farmers were given assistance to start up these industries and taught how to market their products in Yogyakarta. While the cultivation was up to the men, these

[20] This is based on interviews with the farmers when these were the crops that the farmers kept referring to.

[21] The farmers told the author where they planted the seeds. The most common place would be in the back gardens(Farmer 1. Bantul, 2006; Farmer 5. Bantul, 2006; Farmer 3. Gunung Kidul, 2006; Farmer 6. Bantul, 2006)

industries were more often than not run by their wives (Farmer 8. Gunung Kidul, 2006).

Running parallel to the state efforts, there were two other major projects in Yogyakarta during the 1980s and 1990s. While these were separate projects with external funding, they were closely intertwined with programmes carried out by the regime. This was evident when, through a presidential instruction in 1984, shallots were included in a project run by the Taiwanese (Dinas 1984).[22]

In 1981 a project to increase farmers' nutritional intake was initiated by UNICEF (Dinas 1981, and various years). As part of the project, the farmers were given a bundle of seeds for a variety of vegetables and fruits such as chillies, tomatoes and oranges. Along the way, other crops such as mangos were added to the package.

In addition to seeds the farmers received training, which included rudimentary courses on how to cultivate the seeds with the emphasis on ensuring that the farmers in general, and children and women in particular, had a balanced diet including vegetables, meat and cereals (Dinas 1984). The direct funding for this project from UNICEF ended in the mid-1980s but carried on with funding from Dinas in Yogyakarta, making it an important part of agricultural development in the region throughout the Suharto regime.

The other project was carried out in cooperation with Taiwan. This project was not concerned with fruits only but also with vegetables and some dry crops. In the two latter cases, the government had a much more extensive involvement and the role of the Taiwanese was less significant than in the fruit sector. The project consisted of four units, one in each of the regencies. These units worked closely with the Centre for agricultural research in Taiwan and covered both dry crops, such as soybean, and vegetables and fruits. The project worked on introducing Taiwanese high yielding varieties in Yogyakarta. In addition to introducing foreign varieties, the programme also built on experience from other parts of Indonesia where the Taiwanese were active. The idea of the project was that both production and productivity would increase through the introduction of these new varieties and thereby increase the farmers' income. The four centres in the regencies carried out extensive trials in order to make the varieties suitable for local conditions, and to show the farmers the benefits of these new seeds. In addition to trials and demonstrations, farmers were guided by special field officers on how to use the new seeds. While the varieties changed over

[22] Suharto issued presidential instructions from time to time. These were not laws but specific instructions for specific development projects. This could mean a special crop but also other things such as the building of schools, medical centres etc.

time and new crops were introduced, this programme carried on throughout the 1980s and did not end until a couple of years before the regime fell in 1997.

To conclude, vegetables and fruits were given some attention in the development programmes of the Suharto regime, but on a much smaller scale than rice and dry crops and the crops were, as late as 1997, still very much confined to garden plots and less used areas. In fact, the area under vegetables actually decreased both in absolute and real terms at the expense of the less profitable rice. In addition there was a lack of information for the farmers on how to grow these new crops, although there were some courses and demonstrations covering vegetables, primarily within the programme carried out in cooperation with Taiwan. The general tendency, however, was to give the farmers seeds and let them get on with it. In Yogyakarta this was a clear modus operandi as seeds were generously distributed but there were no signs of courses for the farmers on how to use them (Farmer 1. Bantu,l 2006, Farmer 6. Gunung Kidul, 2006).

At first glance the diversification programmes seem to have been well carried out. There were, however, a few problems with the projects. First, diversification was primarily directed towards the second cycle of crops within the rice cultivation paradigm. While these crops were important they were actually, with the exception of peanuts, less profitable than rice. An increase in production of these crops therefore did not lead to an increase in income for the farmers. On the contrary, it would actually have been better had the farmers grown even more rice at the expense of other crops. It seems as if the most lucrative crops were at the bottom of the list of priorities.

Another problem with the system as a whole was its inflexibility. Farmers were forced into growing crops at certain times of the year not only by the climate but also by the state, in this way compromising the farmers' productivity. This was apparent in what was known as *Rapu merah*, which was a cultivation pattern closely connected to the irrigation system. With its help it was possible for the state to force farmers into growing particular crops at certain times. The local government decided where and when the farmers were to grow rice and secondary crops. While this may have suited some farmers, it had a detrimental effect on others (Farmer 7. Bantul, 2006). The system was based on the irrigation warden opening parts of the irrigation system at set times, which was done regardless of the farmers' wishes. By controlling the irrigation system it was in effect possible to flood fields, forcing the farmers to grow rice, or shut down irrigation and thus force them into growing dry crops (Farmer 7. Bantul, 2006).

5.4 The role of the sugar industry

From the discussion above, it is evident that while the state may have had good intentions in wanting to increase production of all crops, they showed less interest in increasing farmers' incomes. Farmers' incomes did increase as a consequence of the higher rice price, but it would have been substantially more beneficial for them, had they been given more support in growing fruits and vegetables. This section gives an overview of another sector of the agricultural economy, namely sugar. Sugar serves this purpose very well as it has been forced on the farmers since the Dutch. As seen in chapter 2, in the past the only interest the Dutch had in the sugar industry was to extract as much capital as possible from the island. Having had such a dominant and detrimental effect on farmers' livelihoods, it is a suitable crop to include in the analysis.

5.4.1 Sugar and income changes in Java as a whole

There was a system in place in Java which forced the farmers to let parts of their land to the sugar industries and cultivation was not necessarily carried out by the farmers themselves. The sugar mills did not own the land cultivated for sugar but, through a rental agreement with the farmers, took on responsibility for growing sugar, i.e. paying for inputs, hiring labour and taking the risk (Soetrisno 1984). The farmers on the other hand could not use their land for the duration, which often meant up to 16 months or up to five rice crops (Soetrisno 1984). As the farmer often did not take part in the cultivation process, he could work elsewhere while still collecting a small income from his fields. At this time sugar cultivation took place almost exclusively in wet land areas also suitable for wet rice. While the system seemed fair to the farmers, there were several downsides to it. A major issue was that the system was compulsory and the farmers did not feel happy about not having the choice of what to grow. This was aggravated by the fact that it paid a great deal more to grow crops other than sugar, rice in particular (Soetrisno 1984:27). This was a consequence of the fact that the rent paid by the sugar mills was based on the sugar price. Even though both production and sugar prices increased after the fall of Sukarno, sugar could not keep up with other commodities, which meant in effect that the farmers' real income from sugar actually declined. This made the farmers more inclined to sneakily try and grow other crops despite the contract with the sugar mills

(Mubyarto 1977). Although production in Java increased in the first half of the 1970s, the sector could not keep up with domestic demand.[23]

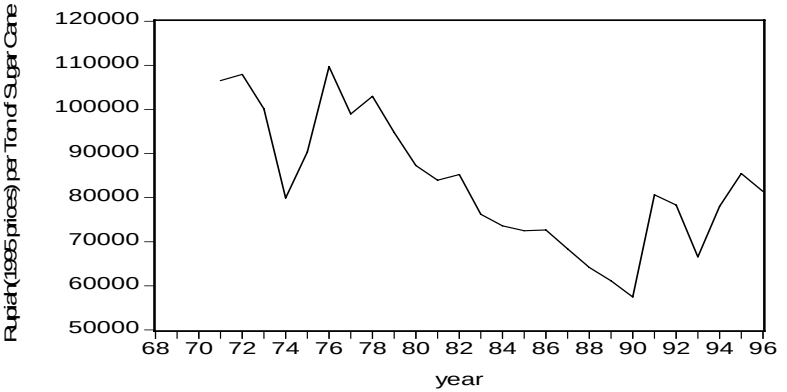
With a change of direction in the second development plan for 1974, it became increasingly important to achieve self-sufficiency in sugar as well (Brown 1982; Mears 1984). As a consequence, from 1975 and onwards, a new policy, which aimed at increasing both production and the farmers' income, was gradually implemented. The new system, *Tebu Rakyat Intesifikasi* (TRI), moved the responsibility for cultivation from the large sugar mills to the smallholders. The farmers were, much like in the Bimas programmes, given a bundle of plants, fertilisers and pesticides. The bundle was distributed by the sugar mills and credits were handled by the state bank BRI. The farmers sold the sugar cane to the mill before repaying the loan (Brown 1982:39-40). In the early 1980s new programmes were initiated in order to increase production and productivity. The new efforts were an attempt to make cultivation more efficient by giving more responsibility to village cooperatives. This made little difference and it was unclear to farmers, the state and the sugar mills exactly how the big loans from the Bank Rakyat Indonesia were to be used. In addition, the producer price of sugar, in relation to rice and other crops, was increased. The purpose of the increase was primarily to create an economic incentive for increased production and the effect it had on the farmers' income was more of a positive by-product. The increases were, however, negated by the decreasing sugar content and so had little effect (Brown 1982; Soetrisno 1984).

The system had a number of problems. First, it may seem as if the farmers had greater freedom in choosing where and when to grow sugar, but this was not the case. Instead, there was little change as these decisions were made by the Bimas programme on sub-regency level with no involvement from farmers. The farmers were thus still in a situation where they had to grow the sugar regardless of profitability. This became a problem as they had little or no experience of growing sugar, since this had previously been dealt with by the mills. As a result, productivity was low (Brown 1982).

Furthermore, although the idea of TRI was to increase production through both extensive and intensive methods, in reality production increase was primarily the result of more land being used for sugar. This meant that land, which in the past had been deemed unsuitable for sugar cultivation, was included, thus reducing productivity in terms of both cane per hectare and sugar output (Brown 1982). The price received by the farmer was based on the

[23] It is interesting to note that the consumption of sugar was negligible in rural areas, so this policy was urban biased.

Figure 5.4.1 Real prices, sugar cane in Indonesia



Note: This is the sugar cane price in Indonesia deflated by CPI (base year 1995) as calculated by World Bank. Although the sugar price may have increased, the sugar content decreased per ton and, as a consequence, lowered the farmers' income.
Source: FAOSTAT

average sugar content in one day. This meant in reality that the lower sugar content in the cane grown under less suitable conditions also had an effect on the price of sugar grown in the most fertile areas. This model for calculation of the sugar price achieved little in terms of real income from sugar cultivation despite the state increasing the price. This is evident in figure 5.4.1. below as the real price of sugar cane decreased steadily from the introduction of the TRI until 1990. Notwithstanding, sugar cane regained some of that lost ground in the 1990s, but it never returned to the levels of the early 1970s.

Another problem the farmers were faced with was increasing transaction costs and the risks of growing sugar, which had previously been borne by the sugar industry. A failed crop did not just entail a loss of income but also hardship when faced with debts caused by the TRI programme. Furthermore, it meant the farmer had invested not only in cultivation inputs on credit but also 16 months of hard work which had resulted in nothing (Soetrisno 1984). This risk was always there, regardless of crop, but the investments in rice, for example, covered a four-month period and a failed crop did not have such long-term effects. In order to lower risks and transaction costs, the government used the *Kelompok Tani* as a coordinating body. Each farmer only grew a small plot of

sugar and working together meant that farmers did not need to worry about obtaining credits, inputs, transportation, irrigation and contact with the sugar mills. The whole process was instead dealt with by the head of the farmers' group, for a percentage of the income. This system, however, was riddled with problems. The sugar mills often had tight control over these group heads and the farmers were not paid a fair price for their produce (Brown 1982; Soetrisno 1984).

In the end most farmers would have preferred to grow other crops, but the state emphasis on sugar actually meant that it crowded out the more profitable rice, which could have yielded a number of crops in the same time frame (Mackie and O'Malley 1988:731).

Thus production was increased through the TRI programmes but not to the benefit of the farmers. Any attempts to improve income were negated by decreasing productivity and sugar content in an inefficient sector. In addition, any increases in farm gate prices had little effect in real terms. It would most certainly have been better for them to grow rice or other, more profitable, crops, but this was not possible as the farmers' groups were 'high-jacked' by the sugar companies. Finally, although sugar cane was more resistant to pests and vermin, the crops sometimes failed. When this occurred, it was the farmers who suffered the blow as there was no financial support from the government despite pushing the farmers into growing this crop (Farmer 4. Bantul, 2006).

5.4.2 Sugar and income changes in Yogyakarta

Sugar has been an important crop in Yogyakarta since colonial times. In the Sukarno era Yogyakarta was dominated by the sugar mill, owned by the local government. This mill practiced a kind of share-cropping system where the farmer let parts of his land in return for a prearranged proportion of the yield. It was not a share-cropping agreement in the normal sense, however, as the share was fixed regardless of the yield. This was generally paid in kind. While the payment scheme changed over the years, this system remained in Yogyakarta even after the TRI scheme had been implemented on a national level (Mubyarto 1977).

Not all areas of Java are suitable for sugar and its cultivation has held different levels of importance in different areas of Yogyakarta. In the drier Gunung Kidul, sugar cane played an insignificant role.[24] In Bantul and Sleman,

[24] None of the farmers interviewed in Gunung Kidul grew sugar.

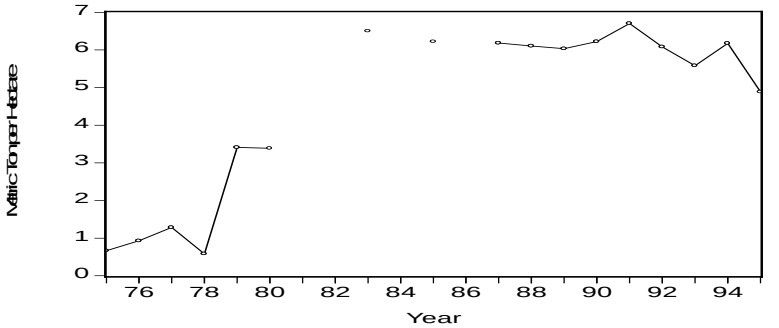
on the other hand, the picture was very different as these areas were extremely well suited for both wet rice and sugar.[25]

The production of sugar in Yogyakarta followed the pattern in the rest of Java with a big increase in production following the introduction of sugar intensification programmes. What is interesting to note is that production initially increased as a consequence of not only the expansion of land under sugar, but also a significant increase in yields of cane per hectare. After this initial surge in productivity, it is clear from figure 5.4.1 that productivity came to a, more or less, complete standstill in the early 1980s. Although there was a slight downturn in the production of cane at about the same time, production soon increased again but this time purely as an effect of larger areas under sugar (BPS, *Yogyakarta in Figures*, various issues). As discussed above, it is not just the amount of cane per hectare, but also the sugar content that matters. While there is no information on sugar content of canes grown in Yogyakarta, it is reasonable to assume that sugar levels followed the general trend of the rest of Java as new areas cultivated were less suitable for the new crop, with farmers not very well trained in how to grow these crops. Since the price of sugar was set by the government and was the same for Yogyakarta, as in any other province in Indonesia, the declining real price of sugar cane was the same for Yogyakarta as for the rest of Java.

The farmers in Yogyakarta were increasingly unhappy with growing sugar (Farmer 4 Bantul, 2006; Farmer 1. Bantul, 2006). There were several reasons as to why the farmers did not like to grow sugar. First, with declining productivity in yields per hectare and in actual sugar content, the price for sugar cane declined steadily throughout the New Order. The farmers said that it was not so bad in the first years of the TRI, but gradually it became worse and worse as the profit became greater in other crops (Farmer 4 Bantul, 2006; Farmer 1. Bantul, 2006).

[25] The wet rice low lands of Yogyakarta are somewhat archetypical for Javanese sugar and rice production. They could have featured as examples in Geertz' view of the ecological setup of Java.

Figure 5.4.2 Sugar cane yields in Yogyakarta 1975-1996



Source: *Yogyakarta in Figures,* various issues

Second, it crowded out other more profitable crops, primarily rice. There were, in the late 1970s, reports of income from rice being almost double compared to that of sugar in Bantul (Brown, 1982:47). In addition, growing sugar cane claimed roughly sixteen months, which in a good year amounted to five rice harvests. Third, the workload was much greater, as the amount of labour that had to be put into sugar cultivation was much higher than that for other crops, decreasing the farmers' opportunities to find additional income elsewhere.

Another big issue was the preparation of land. While rice and sugar cane were both suitable for the irrigated wet lands, the transformation from one type of land to another meant an additional workload. In addition they felt the risk was much greater when growing sugar. This investment in labour and capital needed to get plants and other inputs could not guarantee high returns, or any returns for that matter. The cane fields were repeatedly attacked by pests which could cause the farmer to lose the whole yield. If the farmer lost the crop there was no compensation from the sugar mills. This happened with rice too, but it was not the end of the world, as the season was relatively short and investments not as high, whereas a failed sugar crop could mean sixteen months of lost income.

Finally, the farmers were arranged into farmers groups modelled on the national sugar policy. The farmers had one representative who dealt with the sugar mill and other institutions in the cultivation process. The farmers spoken to were not pleased with this person as they thought he was seeing more to his own needs than to the collective farmers groups (Mubyarto 1977).

During the new order in Yogyakarta there was a growing discontent among those farmers forced to cultivate sugar. There was, however, no one who spoke up publicly as fears of the possible consequences were too great (Farmer 3. Bantul, 2004).[26]

5.5 Conclusion

Booth (2004) has shown that although an increasingly large portion of rural income was derived from sources other than agriculture, farming was still the most important source for a majority of the rural population at the end of the New Order. Consequently, all changes in agricultural income had an impact on rural income in general. In the Indonesian model of development, a dynamic agricultural sector played a crucial part. The regime stressed, in its policy documents, the need for increased production and increased income of the producers.

From the discussion above a few things become clear. Rice was more profitable than dry crops but could not compare with vegetables and fruits. Looking more carefully at the development of the crops, it is clear that the big increase in profits occurred in the late 1970s and early 1980s. That is not to say that income declined thereafter, but it definitely did not increase at the same quick pace after the mid-1980s. While just a few of the major crops are reviewed here, the picture corresponds very well to that of the terms of trade in the sector as a whole. There is ample evidence of the difficulties that the farmers were facing in the 1970s and 1980s. In the 1970s the number of farmers defaulting on their loans in the Bimas programmes was on the rise. In addition, a greater number were not eligible for further loans as they had increasingly bad credit ratings. Although the loans were abolished in the 1980s and thus could not serve as an indicator of the farmer's economic stature, there were other signs of a less than favourable development for the farmers. Farmers who had mechanised in Yogyakarta in the early 1980s were faced ten years later with difficulties financing new purchases without selling land, an indication of how their purchasing power had been undermined.

As for wages, the development was very similar and although there were two periods of increase, it is perhaps most telling that after the mid-1980s there was very little development in agricultural labour wages. The general image is therefore that the food crops sector was a means to increase the population's income until 1986 but then it lost its momentum.

[26] The farmers would not go into greater detail as to what these consequences would be.

This change in policy was a direct consequence of the regime being biased towards the urban sector. It may seem strange to argue that Indonesian policy was urban-biased as the country poured funding into agricultural development. Still, there are a few reasons why this is a likely explanation. First of all, the events of the early 1970s show this with accuracy. Suharto failed to provide the urban population with rice and, as a consequence, he was almost toppled from power (Bresnan 1993). After the debacle in 1972, it became apparent to Suharto that 'rice was policy'. Provide the population with food or they would revoke their support. Important to remember in this context is that it was not the rural population that took to the streets. Thus, the regime was in the hands of the urban elites.

Second, and closely related to the first issue, the goal of the green revolution was to achieve self-sufficiency in rice. When this was achieved, interest in agriculture decreased. This shows that the main goal was to increase production, not create a sustainable sector, generating growth. Instead, the country aimed at increasing industrial production after the mid-1980s.

Third, sugar is probably the best example of how the regime's goals were on a collision course with the farmers' interest. The regime forced the farmers to grow a crop which was less profitable than rice. At the same time the sugar industry was set up in a way where all the risk lay with the farmers, thus making it an even less attractive crop. The farmers had no choice in the matter and they were forced to grow the cane despite decreasing profits. To add insult to injury, sugar tends to be consumed by the urban population. The goal of achieving self-sufficiency in sugar thus seemed to be at odds with rural interests, making this type of production a classic case of urban bias.

The state policy can be questioned for another reason. Diversification was already introduced in the second development plan of 1974. This was in an attempt to expand self sufficiency into crops other than just rice, which so far had been less successful. The diversification programmes, however, always played a secondary role to that of rice, often carried out without sufficient resources or training. The farmers, on the other hand, were interested in the dry crops. This can be explained by the growing patterns. The dry crops did not infringe on the rice season so they were allowed. Another and perhaps more relevant reason was the need to spread risk. As Scott argues, it is not a viable option for the farmer to put all his eggs in one basket. Although the state did not pour resources into the dry crops, the farmers would have grown these as certainly as rice. The result of the diversification programmes was an overemphasis on crops that had a less positive effect on the farmers' income but ensured security. The crops that would have made a difference to the farmers,

i.e. vegetables, were in effect decreasing in area. Fruits were confined to backyards and areas not used for anything else. The lack of enthusiasm from the state for diversification was evident in the farmers' stories about the extension service. The richer farmers often showed a great interest in trying new crops but got little support from the extension services. The poor farmers, on the other hand, had little interest in changing unless they were told to do so or the risk was not too great. They relied much more on the information given by the extension system. The crunch of the matter was perhaps that the state did not offer support if something went wrong. The farmers did not spend resources on mango seeds as these were free, but they still worked the land without profit. Valuable time, which could have been spent on other crops, was thus lost. To conclude, the state was the most dominant force in rural Java, which meant that the farmers' needs were not necessarily taken into account. An image of urban-biased policies and a lack of interest in increasing the farmers' income through diversification emerges.

The farmers who were affluent tried new crops and pushed for change. The majority were principally thinking 'safety first', and were in the hands of the state. Although income had been increased, it was not enough to create a broader base of farmers who could push forward even after the state had withdrawn its support.

Furthermore, as Scott argues, this division between a small group of better off farmers and a large poor group could lead to stratification of the rural economy as the richer had greater opportunities to invest and could harvest greater profits, leaving the others behind. This will be discussed in the next chapter.

Chapter 6

Equity in Javanese Agriculture Under Suharto

6.1 Introduction

The growth of productivity and income in agriculture has been discussed in chapters four and five. While there was a positive trend over the entire New Order, there was some cause for concern as the development seemed to have trailed off after 1985. Focus here is on the third part of the ‘‘East Asian Model’’ of development, equity, in Java generally and in Yogyakarta in particular, under Suharto. The choice of this model was natural as Indonesia based its development strategy on the experiences of Japan. This can be seen in the Indonesian concept ‘*Trilogy Pembangunan’* (Sajogyo and Wiradi 1985), which advocated growth, stability and equity.

Apart from being a part of development strategy, equity is important not just from a moral point of view but, as the World Bank argues, it generates growth by increasing the efficiency of the economy (World Bank 2006). Furthermore, inequality can lead to greater disparities in a cumulative process.[27]

The first development plan in Indonesia was focused on restructuring the economy to deal with the chaotic situation in the late 1960s. Understandably, the priority for the new regime was to return to stability and increase economic growth while battling the rampant inflation. There was already a shift in priority in the second development plan, giving greater weight to equality after economic growth and stability had been ensured (King and Weldon 1977:699). Despite this, the attention remained on economic development rather than distribution until the end of the Suharto regime (Sajogyo and Wiradi 1985; *Repelita* 4-6).

At least on paper there was a dedication to equity, but it is also important to see how this materialised in actual figures.

The aim of this chapter is therefore to examine how equity developed in the New Order. Actions speak louder than words, so the policies of the regime will be discussed. It will be shown that although Indonesia is a moderately unequal

[27] As an example, poor people live in an area with no access to clean drinking water. As a consequence they have to buy bottled water and are forced to pay a higher cost for the water than those who have clean tap water. This way the poor have to pay more for their water than the rich, enforcing disparities.

country, inequality in Java increased as a consequence of the green revolution in the first half of the 1970s. There are decreasing income gaps between 1976 and 1985 but differences in land holdings kept rising. In the final twelve years of the regime inequality of all indicators increased again. It will be argued that this is a consequence of the actions of the state, counteracting imbalances between rich and poor in the middle period, but at other times leaving them to fend for themselves, causing the farmers to revert, as Scott argues, to safety first principles.

6.1.1 Creating a more just picture of inequality

At first glance Indonesia is only a moderately unequal country, although throughout the Suharto era there were several reports in the media that this was not the case. In Suharto's Indonesia equity was measured using the national social surveys (*Susenas*) which are expenditure-based. Hence, equity was measured using expenditure rather than income. While this is generally considered the preferred method, it also leads to equity being overestimated (Huppi and Ravillion, 1991:1656; Yusuf 2005:3). In Indonesia this was a result of expenses being fairly similar in all groups of society since greater income does not lead to greater consumption of the basic goods, used in Susenas.

Furthermore, the data used underrepresents the rich people (Yusuf 2005:3). In order to present a more complete view of the development of equity in Java the expenditure gini-coefficient will be combined with a few other measurements. Firstly, income; by examining regional GDP per capita it is possible to see how the regions of Java have developed in relation to each other. While GDP per capita gives an indication of total income it says very little about the individuals or the differences between different sectors.

Secondly, the effects of development on poverty reduction can be related to equity. It is clear that Indonesia has been successful in battling poverty and the relative success from region to region, as well as between rural and urban areas, can be used as a gauge of equity.

Lastly, as consumption does not include savings, landholdings will be used to give a better idea of inequality of assets in rural Java.

6.2 Equity in Java

6.2.1Expenditure pattern in Java 1970 to 1993

Turning to real per capita expenditures in Java, there is some cause for concern. In the first half of the 1970s rural expenditures actually declined steadily. Thereafter expenditures in rural areas increased at about six percent annually throughout the rest of the decade. In the 1980s, however, the development slowed down dramatically with increases around a mere 0.6 percent annually until 1987. From 1987 and onwards consumption still grew but the extreme increases of the late 1970s were not repeated. This is not very surprising as this trend follows the success of the intensification programmes (BPS, *Survei Sosial Ekonomi Nasional (Susenas)*, various issues). The early years saw a very mixed performance with an actual decline in productivity and in some cases production. The steep increase coincided with the big increases in income, production and productivity which occurred at the end of the decade. The next phase was basically at the same time as production and income levelled out, indicating that the rural intensification programmes played an important role in determining the farmers' consumption and very much followed the same trend. The growth of expenditure in rural areas is, of course, of great interest, but the main interest here is inequality, so a comparison with the development in the urban sector is in order. When comparing rural and urban Java, a much gloomier picture emerges with increasing inequality between the sectors. In the phase when rural expenditures decreased the urban expenditures actually increased. In the second phase rural expenditure actually increased at a slightly faster rate than urban expenditure. Nevertheless, after these good years of the late 1970s the urban expenditures rose at a much faster rate, not allowing the rural sector to catch up. This indicates that although there was a slight convergence at the height of the green revolution, from the longer perspective the general view is that the development policy of the Suharto regime favoured urban areas to the rural population, increasing the differences between the two sectors (Booth 1992:330). This indicates a structural bias towards the urban economy (i.e. urban Bias).

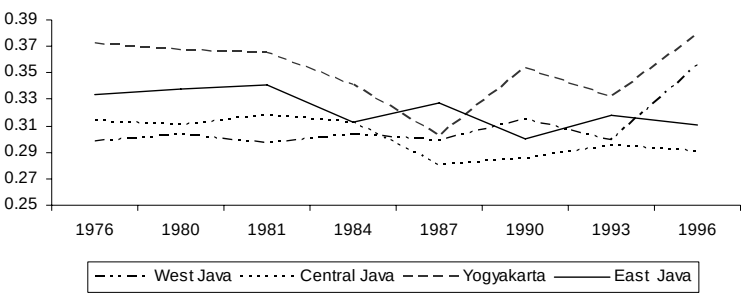
6.2.2 The gini coefficient of expenditure

While the relative change in expenditure within the different sectors indicates a widening gap between rural and urban areas from the early 1980s onwards, a close look at the gini coefficient may help clarify matters. It is important to keep in mind that this shows inequality in expenditure without taking sector differences into account. In addition, the gini coefficient is a very blunt tool as it is used to measure only consumption or income. In rural areas, however, resources and assets are more important. As a consequence, the gini is only one of several measurements used in this thesis. Between 1970 and 1976, the expenditure disparities increased in Java (Asra 1989).

Thereafter, as seen in figure 6.2.2, there was a significant improvement in the expenditure disparities in most of the regions in Java. Despite the major improvements, it is clear that these occurred predominantly in the first half of the 1980s. Thereafter there was an actual increase in inequity. This improvement, though, was only very modest. There thus seems to have been a wave-like pattern, although with a declining trend in Java. The decrease in the early 1980s coincided with the intensification programmes gaining momentum.

Rice self-sufficiency was achieved before inequality turned upward again. In addition, mechanisation kicked off. The implications of this will be discussed in greater detail below. On a final note, while the changes were relatively small, the regions converged in terms of individual inequality until the late 1980s. After that there was a distinct break in the trend for Yogyakarta and West Java with drastically increasing inequality. Yogyakarta will be discussed in more detail below.

Figure 6.2.2 Expenditure disparities in Java 1976 to 1996



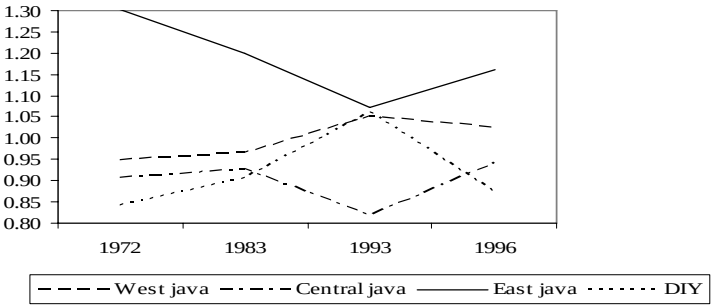
Source: BPS, *Survei Sosial Ekonomi Nasional (Susenas)*, various issues

6.2.3 Regions converging

Judging by the expenditure figures it is clear that the changes in inequality were relatively small over the period. It is also evident that, although Java was not as equal as say Sweden with a gini of 0.22, it was in the same region as the UK in at the end of the Suharto regime (OECD). Java should be considered as moderately unequal (World Bank classifications). Despite these seemingly small changes it is easy to distinguish between two periods with contracting and widening disparities. As noted above, these figures have a tendency to be underestimated.

Let us turn to income disparities between regions. It is important to bear in mind that Java was rather homogenous and that the big differences were more apparent between the centre and the outer islands. Despite this, as seen in figure 6.2.3, there was a clear trend in regional GDP per capita changes in Java in the Suharto era, which may be divided into three periods. In the 1970s there was a slight convergence but all regions, save East Java, were virtually on a par. In the 1980s this trend was accentuated for all regions but Central Java, which at this point diverged from the others. In the 1990s we may once again see that income diverged and at the end of the Suharto era income disparities were more or less the same as in the early 1970s, albeit on a slightly higher level. Regional GDP per capita, however, included all sectors of the economy and tells us nothing of the agricultural sector in particular. Even so it gives a good indication of the development in the agricultural sector, which was one of the major employers in the Javanese economy. In addition, agricultural development is said to be at the heart of the Indonesian economy and thus the growth of a region should to a certain extent also reflect the situation in agriculture. It is safe to say that economic growth came to all regions of Java regardless of economic structure and specialisation.

Figure 6.2.3 Regional income per capita disparities in Java



Note: The figure shows the deviance from an island average
Source: Akita, 2002; Resosudarmo and Vidyatta 2006; Esmara 1975

6.2.4 The number of poor

Another way to distinguish equality is, of course, to look at the number of poor people residing in rural and urban areas. This does not only give an estimate of the differences between cities and villages, but is also a good measure over time. There are several poverty lines in Indonesia that show different levels of poverty. Here, one constructed by Asra is used (1989). In addition, the incidence of poverty is preferred to a relative measurement. At the beginning of the Suharto regime, the number of poor, both in real and absolute terms, was higher in rural areas (Booth 1992:346-347). This indicates that previous economic policy had had only minor effects on rural poverty. Although the various poverty indices used in Indonesia differ, it is evident that great results in terms of poverty reduction were achieved in both rural and urban areas during the Suharto period (Hill 2000). Poverty reduction may be divided into three time periods. From 1970 until 1976 poverty actually increased significantly (25 per cent) at the same time as poverty in urban areas decreased, which must have had an important effect on the rural-urban distribution of wealth (Booth 1992:347). This is particularly interesting as it was during this time that the development projects of the New Order specifically targeted increased production. This seems to have had an adverse effect on the rural poor at least in the early stage of the programmes. In order to feed the urban population the livelihood of the rural community was sacrificed, thus showing how blatantly urban-biased the pricing policy of the Suharto regime was at this point.

In the second period from 1976 until 1981 there was a drastic fall in rural poverty, more than halving the absolute number of poor. This coincided with the period when agricultural income increased in Java and the results are therefore not very surprising. This development was mirrored in the urban areas but at a slightly slower rate. As a result, disparities between urban and rural areas shrunk during this period. This promising trend was halted in the early 1980s as rural poverty, although still declining, did so at a much slower pace while urban poverty reduction continued to show strong results (Booth 1992, Sensus Pertanian 1993). This indicates that the largest decrease in the number of poor in Java occurred when the rice procurement programmes were at their height in the late 1970s and early 1980s. Thereafter, it slowed down although it still decreased. To conclude, while there was a steep decline in poverty both in rural and urban areas of Java it is clear that, in the long-term, the main beneficiary of economic growth in Indonesia was the urban sector. Furthermore, it is also clear that the early phase of the development projects in rural Java may actually have had a detrimental effect and aggravated disparities between cities and rural areas. This indicates that initially the programmes advocated self-sufficiency at any cost. As time went by this was rectified in the coming development plans to some extent, but once oil prices declined and rural self-sufficiency in rice was achieved in the mid-1980s, the dedication to the sector which had been so strong in the last years of the 1970s dwindled, and at the end of the Suharto regime the vast majority of poor in Java were still to be found in rural areas, indicating not just widening disparities, but also the waning interest of the regime in battling rural poverty (Booth 1992; Bidani and Ravillion 1993; Hill 2000). Moreover, there was an inflow of people to the urban areas, indicating that the sector was more efficient in dealing with poverty than the rural one (Booth 1992:343). That poverty is reduced at a more rapid rate in urban areas is often the case as the modern economy is more productive with higher wages. In addition, Lipton argues (1973), it is easier to reach out to the urban poor with better infrastructure etc. The interesting thing to note, however, is that the state obviously did not do enough to balance this out in Indonesia. State policy may even have had the reverse effect, not only in the 1970s but also at a later stage.

6.2.5 Landholding

So far we have seen that, although disparities were relatively low, there are indications of a wavelike pattern with increased disparities in the early phase of the New Order, followed by a shorter period of convergence which was followed by divergence.

One good indication of the distribution of wealth in Java is landholding. The statistics on income may be weak and the gini coefficient on expenditure perhaps underestimated. Landholding, on the other hand, indicates how the wealth in the villagers may have been distributed. First, turning to the gini coefficient, it was evidently much higher than that of expenditures at 0.44 in 1973. Ten years later the figure had increased to 0.49, which indicates that rural inequality had increased notably since the introduction of the intensification programmes (Sensus Pertanian, *Profil Rumahtangga Pertanian, Pola Pemilikan Tanah dan Masalah Petani Berlahan Sempit*, 1983:66). In the 1990s, the figure for Java was just over 0.5, indicating that inequalities kept rising. In the census of 2003 the figure was above 0.7 indicating even faster polarisation (Lokollo 2007). There seems to have been a move away from the centre into a more polarised owning structure (Sensus Pertanian 1993). This fact is corroborated in a number of case studies conducted across Java in the 1980s (See for example Cederoth 1995, White and Wiradi 1989, Breman and Wiradi 2002). To conclude, while disparities in income varied over time, landholdings in Java under the Suharto regime landholdings became increasingly polarised, but there were indications of a slow down in the 1980s. This implies a cyclical pattern in polarisation of land too.

6.2.5.1 The landless

In addition, the gini coefficient naturally only describes the differentiation within the landholding community. Java has historically had a substantial group of landless in rural areas. Throughout the Suharto regime, the number of landless in Java hovered around 40 percent of the rural population, but in absolute terms there was a steady increase. The increase was most accentuated in East Java and least so in West Java (BPS, *Sensus Pertanian* 1973; BPS, *Sensus Pertanian* 1983; BPS, *Sensus Pertanian* 1993). That West Java had a smaller number of landless is perhaps not so surprising, as Jakarta and the surrounding industrial cities absorbed much of the excess rural population. Despite this increase there is evidence that the relative proportion of farmers that were landless began to decline (Booth 1988:52ff). This was most likely a result of rural families finding work elsewhere due to the productivity increases which occurred in the late 1970s and displaced the landless farmers (Booth 1988:52ff). Despite this slight change in direction it is important to note that after the initial surge in productivity there was a slowdown. Presumably it was not as pressing to find work outside the agricultural sector; at the end of the Suharto regime the number was still around 40 per cent (Rusastra, Lokollo, and Priyatno 2007).

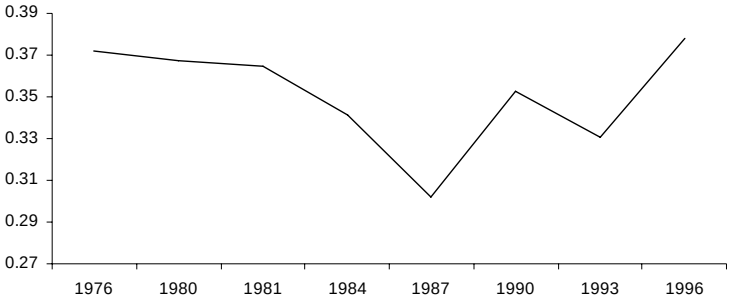
6.3 Equity in Yogyakarta

Looking at Java as a whole there seems to have been a clear pattern of the gap closing between the regions, but a wavelike, albeit increasing, inequality within regions as well as between rural and urban areas.
Turning to Yogyakarta, as seen in figure 6.2.3, the area was poorer than the other regions of Java. Equity will be discussed very much in terms of the same aspects as for the whole of Java, starting with expenditure, then moving on to landholdings, while poverty reduction has been omitted due to uncertainty in the quality of the data.

6.3.1. The consumption patterns

Yogyakarta has not only been a poorer region but has also historically been more unequal (BPS, *Survei Sosial Ekonomi Nasional (Susenas)*, various issues). Despite this, Yogyakarta like the island in general, may be classified as a region which was only moderately unequal (World Bank). At the end of the Suharto regime there was slightly higher inequality than in 1976, but as seen below in figure 6.3.1 there were some large variations in the period. It is possible to distinguish between two periods with very different trends. Between 1976 and 1987 there was a gradual decline which gained momentum in the early 1980s. After 1987 there was a very pronounced break in the trend and inequality drifted up to the same levels as in the mid 1970s. In addition, judging by the evidence from the whole island, it is highly probable that the expenditure inequalities in Yogyakarta in the period prior to 1976 were substantially lower, and that from 1970 onwards there was a significant increase in inequality. This meant that Yogyakarta also experienced this wavelike pattern of increasing disparities in the early seventies, followed by a period of declining disparities for about ten years and then the return of increased inequality from the second half of the 1980s.

Figure 6.3.1 Expenditure inequalities in Yogyakarta 1976-1996



Source: BPS; *Survei Sosial Ekonomi Nasional (Susenas)*, various issues,

6.3.2. Landholdings in Yogyakarta

A typical wave-shaped development in expenditure inequalities occurred in Yogyakarta during the New Order. It is also clear that although higher than the rest of Java it was still within the range of what would be characterized as moderate inequality. The landholding in Yogyakarta, on the other hand, showed that the region was far from equal. In table 6.3.2 it is evident that Yogyakarta was a region with a majority of the landed farmers owning less than 0.5 hectare of land at the beginning of the intensification programmes (Sensus Pertanian 1973). It is interesting to see that as the development process gained momentum in the late 1970s, there was a levelling out (Sensus Pertanian 1983). A more detailed study of these farmers reveals that in 1983 the number of mid-range landowners decreased, while the number of poor and rich farmers increased, indicating polarisation of landholdings and thereby also increased rural inequality. For the period 1983 to 1993 landholding is only broken down to those owning more or less than 0.5 hectares, but there is no evidence of this polarisation having stopped, and taking into account the increasing number of small landholders, in combination with decreasing average landholdings, it is reasonable to think that the trend of growing landholding inequalities continued (BPS, *Sensus Pertanian* 1993). The result is that average land holding at the end of the Suharto regime was much smaller than 20 years before, at the same time as the number of farmers owning less than a hectare increased, indicating an increased polarisation.

Turning to the two regencies in this study, Gunung Kidul and Bantul, the image can be clarified somewhat. As these two differ demographically, with a

Table 6.3.2 Land owning structure in Yogyakarta

	1973	1983	1993
> 0.5 ha	120,331 (35)	165,102 (47)	127,975 (30)
< 0.5 ha	223,241 (65)	188,645 (53)	304,830 (70)
Average landholding in hectare	0.53	0.67	0.44

Source: BPS, Sensus Pertanian 1973,1983,1993

very high population density in Bantul and a much lower density in Gunung Kidul, the farmers with more than 0.5 hectares constituted more than half of the agricultural households. In Bantul, only about ten per cent of the households had more than 0.5 hectares. Considering the yields of the land it is likely that Bantul was still the more prosperous. The village in Bantul reflected this image with about 10 per cent landless. In Gunung Kidul, on the other hand, the figure is more in line with the average for the rest of the province (Ekbang Bantul, 2006; Ekbang Gunung Kidul, 2004). In addition, both villages experienced a decrease in the average size of landholdings (Ekbang Bantul, 2006; Ekbang Gunung Kidul, 2004; BPS *Sensus Pertanian* 1983, BPS, *Sensus Pertanian*, 1993). In both regions there was evidence suggesting that the landless and poorer farmers had little chance of obtaining more land. One landless respondent, when asked if he wanted more land, said that he certainly did but there were a number of reasons for not being able to purchase any land. First, in order to buy land one needed a loan which the bank would not give him as he had no collateral. Second, even if he could get a loan he did not like the idea of having a mortgage; it was a risk he was not willing to take. Third, it was very rare that land came out on the market and if you wanted to buy a piece of land it was necessary to have the right contacts (Farmer 5 Bantul, 2006). While all stories were not the same, they followed a similar theme, indicating that it was virtually impossible to obtain land. This argument is further strengthened by the fact that out of the roughly sixty farmers interviewed in Bantul and Yogyakarta, no one had moved from landless to smallholder.

The richer farmers interviewed gave a slightly different view. They started out as workers in their parent's fields, and at a certain age, or more commonly

when they got married, they inherited a small piece of land from their parents.[28] On such an occasion the wife also contributed some land from her parents, thus consolidating the lands. The farmer's son often had brothers and sisters who could also be entitled to land, but as a general rule one brother bought or leased the land from the other brothers who went off to work in Jakarta or elsewhere. Alternatively, he farmed the lands of his in-laws (Farmer 1. Gunung Kidul 2006). If all the siblings stayed within the village they owned the plot separately but cultivated together. The landed farmer often combined this small plot from the parents with a smaller one leased from other farmers (Farmer 1. Bantul, 2006). Often the farmers would buy this piece of land if it came up for sale when the owner was too old or had financial difficulties. In this way land could be concentrated within certain families. Another way of obtaining land was through the civil service, as there were lands dedicated to the village heads etc as payment for their work (Farmer 1. Bantul, 2006). These areas were often large, over ten hectares, and as the civil servant was busy working he would lease it to other farmers. He thus accumulated profit which he could invest in more land, gradually increasing his family's wealth. These positions were often kept within the same extended families, as has been showed by Husken in a series of studies from Java (Hüsken 1984).

Some of the landless farmers in the villages had been landless for more than one generation, but there were also those who had been forced to sell their land (Farmer 5. Bantul, 2006). When they owned land it was often in the form of very small pieces insufficient to feed a family. When the children had to go to school the land was sold to finance tuition fees etc. (Ekbang Bantul 2006).

In addition to this shift downwards in the size of lands, the absolute number of landless in Yogyakarta grew steadily throughout the Suharto regime. While this does not necessarily indicate widening gaps in income, as the landless labourers may very well have had other non-agricultural incomes, Timmer has shown that that there is such a connection for Java.

[28] To inherit land from one's parents seems to have been a common way for farmers to get their own land in all the villages studied. It is perhaps odd to receive land before the death of the parents(interviews).

6.5 State actions with an effect on disparities

6.5.1 The intensification programmes

The intensification programmes served as the main vehicles for development in Java during the Suharto regime. These seem to have had little effect on expenditure disparities in Java over the course of the Suharto regime. The effect on income disparities seems to have been much greater. If measured by the number of people living below the poverty line, it is clear that the programmes had a significant effect particularly in the late 1970s. Although the rural areas began to catch up with the urban ones, they still remained far behind throughout the regime. This indicates that the intensification programmes perhaps had an initial negative impact on rural areas with only the richer farmers being able to afford new technology as suggested by Scott (Scott 1976:17).

This seems to be confirmed by a number of studies in the first half of the 1970s, particularly from the Agro Economic Survey team, which predicted that the modernisation programmes in Javanese agriculture would have a detrimental effect on equity in the villages. Modern technology would benefit the already affluent as they could quickly adopt the new technologies. This is not surprising since they had the resources and quickly saw the benefits in terms of higher profits. In addition these richer farmers often belonged to the village elite and thereby had a closer connection to the local governments and the extension officers. As a consequence, they received information on modern technologies faster. Finally, as they were better off they were not so vulnerable, and were more ready to take risks (Hüsken 1984:1-3). Husken has focused on a couple of villages in West Java, but there is also ample evidence from Hayami and Kikuchi, among others, that it was not just some random incidence of this in one place alone (Hayami Kikuchi 1981). While this may have been the case initially, it soon turned out for the better with increasing equality and lower rural poverty. As the intensification programmes matured in Java, it became clear that the farmers in reality had very little say and they were more or less violently pushed into line. On the path towards self-sufficiency in rice everyone who grew rice, which in Java was more or less everyone, switched to new rice types (Booth 1988).

As was stated above, expenditure only captures part of the problem. This could be seen in the number of poor living in rural and urban areas but was more evident when looking at the distribution of land. Disparities were considerably higher and there was no sign of them decreasing sharply. Neither was the problem of landlessness being solved. As a consequence we will look a bit

closer at two strategies of addressing these issues, namely land reforms and transmigration.

6.5.2 Someone has to pay for the production of rice

Food security and the procurement of rice and other basic foods were at the core of the Indonesian development policy. To stimulate production the Indonesian government under Suharto used economic incentives to increase the price received by the farmers gradually over time. The price of rice was decided with the help of the price of fertilisers (Roche 1994). The government set a floor price under which rice could never fall. The state could do this through its food logistics company *Badan Urusan Logistik*, Bulog (Booth 1988). While this ensured that the farmers received their share, there was also a ceiling price which was designed to protect the non-rice producing part of the population (Sajogyo 1993). If demand was lower than production, Bulog bought the surplus and stored it in order to sell it at a later date when demand exceeded production. Although this system created a sense of stability for the rice producing farmers, most studies have shown that it benefited the consumers more than the producers (Sajogyo1993:49). This would in the long run benefit the urban population. It is important to bear in mind that about two thirds of the rural population in Java are net consumers of rice, as they are either landless or own too small a plot. This means that the rice pricing policy in place in Java was actually in favour of the rural poor. Unfortunately, according to Sajogyo (Sajogyo1993:49), this was counterbalanced by other development policies for rural industrialisation, which mainly benefited the richer strata of rural society. Our main concern here is the agricultural sector and consequently these polices will not be discussed.

6.5.3 Land reforms

The problem with uneven land distribution was recognised by Sukarno. In fact, land distribution was arguably at the heart of the conflict, which eventually led to the events in 1965. In 1960 a law devised to redistribute land was implemented. While the law, naturally, included the whole of Indonesia, Java was the main area of concern, with increasing landlessness and fragmentation of land (Utrecht 1969). The basic principle was to give land to the tillers and thereby abolish the system with hired landless labourers cultivating the big landlords' land. It is generally agreed that land reform had positive effects on agricultural production, as these farmers utilised their land better with

intensified cultivation (Griffin, Azizur and Ickowitz 2002). A land reform would lead to higher production and productivity but another important effect was to even out income disparities (Utrecht 1969:72).

The idea in Indonesia was that the big landowners would be offered compensation for giving up their land, enough to enable them to start up business in other fields (Utrecht 1969:72). The reform was thus to have an impact in the agricultural sector and create that class of indigenous entrepreneurs which Sukarno believed necessary to achieve prosperity.[29] The new law had several implications.

First, it made all types of absentee landlordism illegal. Second, the land reform was to regulate the size of land belonging to each farmer. This policy was twofold. It was to regulate the maximum size of landholding so as to remove the large landholders (Utrecht 1969). Equally important, however, was to guarantee the smallholders and landless a minimum size of land. In addition, the allowances were not static but varied depending on two factors, type of land and population pressure. This meant that land under wet rice, which was more fertile had a lower allowance than dry land and that Java, which was densely populated, had the lowest allowance of them all (Soemardja, 1962:26).

Furthermore, the number of landholders in Java that actually held more land than allowed by the new law was very small. Therefore, the term was widened to include all land that the farmer had access to through, for example, leases. Finally, it was assumed that each household consisted of no more than seven people. If the family was larger, additional land was granted, but never more than 20 hectare (Utrecht 1969:76). Right from the beginning there were some major problems implementing the new law in Java.

First, those who had land did everything they could to keep it. This was done by trying to find loopholes in the regulations, but more often than not it was easier for the farmers to hand over land to relatives or close relations who could be trusted (Utrecht 1969:76). This way it looked as if they had less than they actually did.

The second problem was the size of landholdings. The plots were already small in Java and big landlords were relatively few (Booth 1988:136). This meant that if land was to be freed the maximum was set far too generously. Moreover, the compensation promised by the regime to those who ceded land was never paid, making the incentive for the landed households even smaller

[29] In Indonesia at the time of Sukarno there was a weak indigenous middle class. It was believed necessary to create this class as it was the core of domestic capital accumulation. In addition the entrepreneurs present were generally of Chinese origin. These were, however, not approved of and a counter balance was needed (See Robison 1986 271-272; Rickleffs 1993:247).

(Utrecht 1969). Finally, as a result of the inefficiency of the boards dealing with claims of ownership, there were often conflicts between the landless and the landowners. This gradually escalated and culminated in the coup attempt in 1965 (Utrecht 1969).

There was a massive drive toward evening out the unequal landholding in Java during the Sukarno regime. These were not very successful, but there was redistribution of several hundred thousand hectares of land. In the first years of the Suharto regime, the redistribution continued although on a very minor scale. It was planned to be carried out but it just never materialised. At the same time as there was redistribution to the landless households, the change in regimes meant that many of the old landlords who had ceded land now reclaimed their land. The Suharto regime had little interest in land reforms in the first place and the military sided with the landholders. Hence, from the early 1970s onwards land reforms were no longer high on the agenda despite the law still being in place. In addition, there were other, new groups in society backed by the military that claimed land. The result was that the land did not pass back to its previous owners, but did not go to the landless it had been intended for either. Throughout the Suharto regime there were occasionally voices pushing for land reform but little came out of it as the political elites in the villages had no interest in a redistribution of land. Calls for land reform were few and far between in the Suharto era and generally associated with calamity. When other, more pressing issues came up it was soon forgotten again (Arndt 1978:27).

While Sukarno sought to build a political powerbase independent from the military and religious factions, Suharto did not have the same political need for the farmers. It was important for him to avoid social unrest, for example by means of a land reform, but since he was allied with the landholders there were two other solutions for this. First, the transmigration programmes and second, the green revolution in Java did not just entail greater labour absorption in the agricultural sector but also increased the job opportunities in construction etc. So, the main purpose of a land reform was never to even out disparities and give the landless a plot of land, but political. As Suharto had different needs compared to Sukarno, land reform was off the agenda until his downfall in 1997.

6.5.4 Transmigration

Another area which had great impact on the distribution was the transmigration programmes. These programmes had already begun in the Dutch colonial period (Booth 1988:94). After independence the transmigration programmes were expanded. The idea was to relieve Java of the immense population pressure by

sending landless or the almost landless to the outer islands were they would be given a plot of land. This would take the strain off the resources in Java while it increased the standard of living of the families that moved. While not an official goal, it is also clear that the transmigration programmes could serve well in the cooling of conflicts in areas of Java where land disputes were common. It thus helped in preventing social unrest. In the Sukarno era roughly 19000 people were moved annually but this increased drastically in the Suharto regime. In the course of the first development plan 36000 people were moved and this number was doubled in the next five-year plan (Arndt 1983) The number of farmers transmigrating annually kept on increasing until the middle of the 1980s(Arndt 1983). In the final years of the Suharto regime the flow from rural areas of Java to the outer islands was as high as that of migrants coming in the other direction (Manning 1998:79). While this, no doubt, was a massive operation, there are two reasons for it not having such a huge effect on the number of landless in rural Java. First, a couple of million people transmigrated and this may have had an effect on the recipient locations. In Java, on the other hand the number of people who moved was only a fraction of the population increase in the same period of time (Arndt 1983). As a consequence, the transmigration programmes only served as a minor vent for the growing population pressure in Java and was only a way to buy time. Second, while the numbers that moved out each year increased in the 1970s and early 1980s, they began thereafter to decrease, having even less of an impact on rural Java than before (Arndt 1983).
Despite being an enormous and ambitious project it was still on too small a scale to have a serious impact on rural Java. Perhaps it was only a show of might?

6.7 Policy in Yogyakarta

The discussion above gave a more general view of the impact of development policy and what was done to fight income inequalities in Java as a whole. Of course, these national policies also had an effect on Yogyakarta, but it is still of great importance to study these from a more regional perspective. Rice-pricing policy and land reform were national issues and do not need any further scrutiny as these would not have been different in Yogyakarta. The roles of the intensification programmes, however, as the focal point of the Indonesian development project, are of extreme interest.

6.7.1 The intensification programmes

The intensification programmes in Yogyakarta had, no doubt, a massive impact on rural development. The programmes led to increased welfare and income for both farmers and agricultural labourers. At the same time, as seen above, there was evidence of increasing disparities in landowning, income and expenditures. In combination with fears of increasing disparities and the third leg of development policy, equity makes it particularly interesting to see if there were any efforts in the development process (Sajogyo and Wiradi 1985). There were two phases in the modernisation process of agriculture that focused on different types of technology, namely biological and chemical contra mechanical. The first one was big and had a profound impact and was driven by the government, while the second was done on a much smaller scale and was farmer driven. This section discusses the possible effects these two drives for modernisation had on equity in Yogyakarta[30].

6.7.1.1 Biological and chemical advancement

The introduction of biological and chemical improvements in Yogyakarta had already begun in the early 1970s. Initially, it was the richer farmers who took part in the projects. The programmes were very rudimentary and only included a few farmers during this period of time. The inputs were to a certain extent available to all but only the few who got them on credit could benefit greatly. Gradually, the projects grew in size putting more wet rice land under modern cultivation. When the farmers saw the improved harvests in the intensification projects, they also wanted to be a part of it. In the 1980s, according to the PPL officers in Bantul, the degree of participation by the farmers was more or less the same in all income groups (PPL officer Gading Sari, Bantul, 2004).

Furthermore, the intensification programmes were by no means voluntary and, as the control mechanism in the system became more sophisticated and efficient, no one could refuse the programmes. As the system gradually tightened up with the Insus and supra Insus programmes, the farmers had little to do with the choice themselves. When looking at the evidence of the share of farmers not using the new seeds, it is clear that while there was resistance in the early phases of the intensification programmes; by the mid-1980s almost no one was using old fashioned seeds anymore (Dinas 1980, 1984).

[30] This section draws on the development reports from Dinas but also from interviews with PPL officers and to some extent farmers

6.7.1.2 Mechanisation

As seen in chapter five, mechanisation in Java and Yogyakarta did not pick up pace until the second half of the 1980s. As a consequence, mechanisation was perhaps most important in the second phase of modernisation which was also the time when we see how disparities once again increased. The adoption of relatively cheap tools such as the threshers seems not to have been a problem for the farmers. Similarly, the very expensive post- harvest tools such as mills were often financed by cooperatives, farmers groups or by richer individual farmers who doubled as middlemen. Looking at the introduction of tractors, on the other hand, it is clear that the local regime did little to stimulate the poorer farmers into investing in tractors. Two strategies were used when introducing tractors in the villages in Gunung Kidul. First, and this had a positive effect on all farmers regardless of wealth, the irrigation groups in each kecamatan were given one or two tractors. These tractors had to be paid off gradually and the farmers hired them from the group (PPL officer Sri Hardono, Bantul 2006). The bigger farmers, who used it more, then had to pay the bulk of the loan, while the smaller farmers still had access to the tractor but did not have to pay so much. Still, this programme was on a small scale and the two or three tractors available made it difficult for all the farmers to get a chance (PPL officer, Sri Hardono, Bantul 2006). This scheme eventually evolved into a system where the local government provided tractors on credit to the farmers. All farmers, regardless of wealth, were eligible for this and could apply through the local irrigation group and PPL (PPL officer Sri Hardono, Bantul 2006). There were a couple of problems with this system. First, when talking to the poorer farmers, and this is not unique to loans regarding agricultural machinery, they were afraid of taking on too large financial commitments (PPL officer, Sri Hardono Bantul 2006). Consequently, the poorer farmers did not submit applications for purchasing the tractors.

Second, in order to get more of the poor farmers to invest in mechanisation, it would have been necessary for the regime to target these farmers; instead, the extension officers in cooperation with the heads of the water boards, only chose the richer farmers to be recipients of these better loans (PPL officer, Sri Hardono Bantul 2006). These were deemed to have a better chance of repaying the loans. Finally, the farmers could, of course, purchase the tractors directly from a vendor by using their credits. Again, this was something only the very richest farmers did, and the interest rates were much higher than the ones offered by the state. At the end of the Suharto regime the few tractors available in Gunung Kidul were owned by the very rich, and though they were leased to poorer farmers there were not enough to go around.

The situation in Bantul was very much the same in terms of ownership as most tractors were purchased by the richer farmers (PPL officer Sri Hardono, Bantul 2006). The poorer farmers were, perhaps not so surprisingly, averse to taking loans and could therefore not finance a tractor. As seen in chapter four, tractors became gradually more common in Bantul in the course of the 1980s and by the 1990s were used by a large proportion of the farmers. This was done through an arrangement like the one in Sri Hardono, where one of the richer landholders bought a tractor in 1984, which he let to other farmers in his village. This way he could make a small profit from the tractor and invest in another one a few years down the line. The first tractor was bought using credit but the second was bought with cash (Farmer 1. Bantul. 2006). This allowed more farmers to use tractors at the same time as it made the already rich farmers even richer. Another alternative was to use one of the tractors bought by the Farmers group, but as discussed in chapter four there were only a few of these tractors available as the state efforts were small.

6.7.1.3 The diversification project

The efforts to diversify were partially aimed at increasing the income of the poor farmers in rural Java. It is, however, unclear exactly what effects these really had on stratification. A very clear example of the repercussions of such a strategy can be found in Bantul and Gunung Kidul. The farmers were given seeds to grow mangos in the mid-1980s. The seeds were given to all farmers with no regard to the size of their land or their resources in Bantul (Dinas 1980, PPL officers Bantul and Gunung Kidul). While one could argue a distributional mechanism like this has its merits as everyone gets a little bit richer, it has no effect in terms of bringing the poor closer to the rich. On the other hand, the system in Gunung Kidul was even biased towards the better off farmers as the distribution of fruit seeds was based on landholdings (Farmer 6. Gunung Kidul, 2006). Consequently, the poorer farmers only received a few seeds to plant in their back garden while the rich ones could have enough for a small garden plot of mango trees.

In addition, the richer farmers obtained information on how to grow the fruits by borrowing, or even buying, books on the matter from Yogyakarta. They planted the trees in fenced off areas in their back garden. Some of these farmers still reap the benefits from these trees (Farmer 1. Bantul, 2006). The poorer farmers, on the other hand, tell a very different story. They lacked the resources and information on how to grow the new plants. One farmer planted his trees in the courtyard were animals walked and grazed, or the children played. This, in combination with lack of knowledge on how to water the new plants resulted in

them dying after just a few months (Farmer 3. Bantul, 2006). This lack of information and support seems to have been a recurring problem for the farmers. The less adventurous farmers tell stories of how the extension officers rarely had any useful information on how to grow crops other than rice and dry crops (Farmer 3. Bantul, 2004). The state held a monopoly on information through the radio, newspapers and civil servants, thus making it difficult for these farmers to make any changes not sanctioned by the state. The more enterprising farmers on the other hand felt that in the past there was very little support from the extension system, and that they had to get the information themselves from town (Yogyakarta). Before the fall of the Suharto regime the extension service had more or less a monopoly on information (PPL officers in Sanden, 2004). This meant that getting information on cultivation procedures, new plants etc was very hard to come by unless one was well connected. In addition the extension officers showed very little interest in listening to the farmers' advice on the new crops. The system was not very interested in new crops, if it had to be done at the expense of rice.

6.7.1.3 Other projects within the system

In addition, there were a few aspects in the modernisation project carried out in Yogyakarta that deserve a short mention as they reflect the general importance the local regime gave inequalities.

First, the transmigration programmes, just like for the rest of the island, had been in place since before Suharto came to power. The number of families included in the programmes was relatively small and, judging by the steadily increasing population density in the area, they had little effect on local conditions (Dinas 1970-1996 various issues).

Secondly, and much more important, was the migration that took place in order to find jobs elsewhere in Indonesia (most often Jakarta but also the industrial zone of Batam) when there were no jobs in Yogyakarta, or if one was not the eldest son and therefore had no access to the family land. Throughout the Suharto era there were opportunities work in Korea, Malaysia and other countries. For instance a son would go off to Jakarta and work there for several years and not return until there was space for him at the family farm. In the meantime, he, or she, would send remittances to the family, improving their lives. If a farmer went on to other places in Indonesia, it seems to have been of a more permanent character. Many of the farmers tell of their sons or daughters living in Jakarta, who only come home for public holidays such as Ramadan (Interviews in Gunung Kidul 2006; Bantul, 2004). When they return they often have presents or food with them. In addition, all money that is sent home goes

through the local government and is taxed, thus contributing to the development of the village (Ekbang Ponjong, Gunung Kidul,, 2004). The few farmers interviewed that had been living in Jakarta had only returned as their parents had died and someone needed to take over the farm or, more commonly, they had been made redundant as a consequence of the financial crisis in 1997(Farmer Duwet, 2004). Had there not been some sort of calamity, it is unlikely they would have returned.[31]

Another type of migration abroad was of a much different character. The migrant would go off for two or three years on a contract and then return. These migrants thus did not leave the village behind but would return with a substantial savings account ready to start up their own business. This type of migration was carried out both privately and through the help of agencies. Agents representing the employers came to the Bantul every year (seemed to be mainly Korean in Bantul). They would set up a small employment agency where the farmers could go and apply for a job. This agency cooperated with village officials to ensure that it was all above board. If the farmer decided to take a job there would be contracts signed and that was that. The government thus actively helped the farmers in this migration process (Ekbang Bantul 2006).

Finally, the sugar industry more thoroughly analysed in chapter five deserves mentioning here as an illustration of the state's bias towards the urban consumers. Sugar was not produced everywhere but wherever it was grown, in Yogyakarta and elsewhere, it had a detrimental effect on the farmers' income. While other crops in the intensification programmes were not just consumed by the urban population, sugar was almost exclusively a luxury commodity for the towns. The need for self-sufficiency in sugar under the New Order is thus highly questionable. Any hardship that the rural population suffered from the rice intensification programmes could be justified by the higher good of feeding the rural as well as urban population. No such claim could be made for sugar.

6.8 Summary and conclusion

The third leg of the development policies in Japan and other North East Asian countries was to ensure shared growth and social balance. That this was also the intention of the New Order model is clear, as equity is listed alongside economic growth as one of the principal goals. Initially economic growth was seen as more important but gradually equity increased in weight.

[31] There is ample evidence in Indonesia of a ruralisation process commencing shortly after the crisis hit. It is thus likely that these returnees reflect a general pattern across Java

Looking at expenditure inequalities in Indonesia is a risky business as these tend to be underestimated and do not include the richest in society, thus painting a more rosy view. As a consequence, we also use other ways of measuring inequality, most significantly poverty incidence and landholding. Poverty incidence allows a good comparison between the rural and urban sectors of the economy, while landholding disparities give a good indication of inequality in rural Java.

The overall image that emerges shows that Java has gone through three phases in terms of inequality. From 1970 to 1976 there was increasing inequality in terms of both expenditure and land. Furthermore, a similar trend can be seen for poverty incidence. Perhaps most interesting is that rural poverty increased during this period not only in absolute but also in relative terms. This indicates that the rural programmes for intensification had a detrimental effect on income. It could be argued that it was a result of labour displacing technologies but, as seen in chapter four, there was little mechanisation. In addition, the absolute number of people engaged in agriculture increased and labour productivity was stable or declining. In chapter five it was evident that real wages during this period were also stable in the sector and state policy put production above income. This was in response to the demands of the urban population for a food supply, which they pressured Suharto into realising after the rice crisis in the early 1970s. What we see here is thus a clear case of urban bias, as the regime bowed to the urban population in order to stay in power, making the rural poor suffer in the process. It seems as if growth had a detrimental effect on the poor of rural Java.

The following ten years showed considerable improvement in expenditure disparities and also a slowing down in the polarisation process in the landholding structure. This was a period when there were great productivity increases, resulting from the Insus programmes. In addition, income increased for both farmers and landless. Furthermore, there was a considerable increase in labour productivity as machinery started to be implemented in agriculture. It could be argued that this was a time of rural bias in Java. True, large resources were put into agricultural development but a few issues have to be kept in mind. The improvements for the poor and the decreasing income disparities were a result of two things.

First, as Scott has argued, the farmers lived by the safety first principle. This meant that they did not try new technology if it was seen as risky. They would not have tried the new technologies unless forced to. This coercion became increasingly efficient and the farmers had little choice in the latter half of the 1970s. It may be said that the poorer farmers thus achieved a certain

measure of success, closing the gap between them and the richer farmers. The second issue needed to be considered is urban bias. Poverty decreased at a time when not only yields but also labour productivity increased the most. That meant that the benefits from the new technologies were not negated by a growing rural labour force. The mechanisation that took place, however, as seen in Yogyakarta, was a result of private initiatives from richer farmers. The state did nothing to prevent mechanisation but did little to encourage it. The introduction of tractors was, of course, one example of this but perhaps more interesting was the introduction of threshers. The farmers learned about these from university students or friends. The PPL officer wanted the farmers to use them, but they did not like them in Bantul.

This becomes so much more apparent in the last ten years of the regime, 1985-1995. At this point there was an increase in inequality in expenditures as well as in land holdings. The state had no longer the same drive in the agricultural programmes. Mechanisation, on the other hand, had slowly begun, and was carried out by the wealthier farmers.

In Yogyakarta it would be entrepreneurs like one farmer in Bantul who purchased the tractors only to let them to other people. Most farmers could not risk buying the new tools, nor obtain a loan to finance such a purchase. It was seen as risky and many stayed with the buffalo for ploughing. The reaction of the state was in stark contrast to the development in the intensification programmes where there were incentives and coercion. As a result it was the more affluent farmers who invested in the new technology and thus made greater profits, leaving the other farmers behind.

In the last ten years of the regime poverty reduction was still present but much slower and, as was shown by Yusuf, it is questionable how far from the poverty line these people really were (2005). While the regime did not work against poverty reduction as it had in the first half of the 1970s, it was not exactly helping either. The diversification programmes in Yogyakarta, for instance, did not help the poor very much when it came to highly profitable crops such as fruits. Seeds were given to the farmers on the basis of the size of their landholdings, thus benefiting the larger landholders. In addition there was little information on how to use the new seeds, causing many of the poor farmers to unintentionally kill the plants within a couple of months. The result was that the project seemed to benefit the rich more than the poor.

There are a few other issues which indicate the urban bias of the regime. Land reforms for example. Arguably land reform has a positive effect on both yields and labour productivity, but this was never carried out wholeheartedly in Java. Lipton would argue that this was a case of landholders being allied with

the urban elites. We shall leave this argument here, but it interesting to note that land reforms were abolished soon after Suharto's coming to power. As it was, land concentration was not very high, but in the course of the regime it increased.

To conclude, Java seems to have been at least as unequal at the end of Suharto's regime as in the early 1970s. The regime had a mixed performance and its intentions can be questioned. There are two sides to the problem. First, growth was the paramount goal in the early part of the intensification programmes. Inequality mattered little and it was believed that growth was good for the poor. In this second phase, equity was brought higher on the agenda. On the other hand, it is questionable whether this led to decreased poverty and shrinking disparities. Instead it was more a consequence of the regime wanting to ensure that everyone was part of the intensification programmes in order to produce more food, thus taking the consumers' point of view. In the last phase this seemed to be apparent once again as the state did little to help in the next stage of development and focused on other parts of the economy instead, yet again believing that growth would benefit the poor. The slowdown in improvements tells a different story.

Chapter 7

The Agricultural Transformation in Java: A summary and a Look at the Future

7.1 Introduction

This thesis is focused on agricultural transformation in Java and the driving forces behind it. Agricultural change in Indonesia was the object of many studies in the midst of the green revolution in the 1970s and the early 1980s, but thereafter interest seems to have waned as other sectors of the economy gradually grew in importance. In 1997, Indonesia was hit by an economic crisis, which had a profound impact on all parts of the economy, and it became apparent that the agricultural sector was not ready to stand on its own two feet. The crisis showed the need to revisit the agricultural sector in Indonesia and re-examine its transformation under Suharto (1969-1998). Indonesia has often been grouped with its successful neighbours in the north-east as a miracle economy. These economies base their success on a dynamic agricultural sector which has experienced increased productivity in yields and labour, increased income and last, but not least, equity. Looking at the Indonesian economy, these are the key issues that need to be addressed in order to understand the transformation process under the New Order. It is argued here that there were significant improvements in all three areas, but these occurred in the late 1970s and early 1980s, with the state being the driving force behind transformation, through a number of intensification programmes. Another consequence was that the motives of the state were directed by the needs of the urban population (i.e. cheap and readily available food). The bottom line was that while great improvement had been made, the agricultural transformation process stalled once self-sufficiency in rice had been achieved.

This chapter has been divided into three sections. In the first section the findings will be discussed in a summary. In section two, there is a more theoretical discussion regarding the forces behind change and agricultural transformation. The third, and final section, is an epilogue of the agricultural

development in Indonesia since the ousting of Suharto. This section also gives a brief discussion on the policy of today and what path the country should take.

7.2 The Findings

Although Japan, Korea and Taiwan differed in their development, there were three core characteristics. First, all three increased the productivity of both land and labour, which in turn led to increased income in agriculture. Both labour and capital could thus be transferred to other sectors of the economy. The third criterion, equity, is closely intertwined with the other two. This was achieved through a land reform which created a strong class of smallholders. Although the land reforms in the three countries were carried out primarily for political reasons, they had fundamental economical effects as agricultural policy became a much more effective tool for the prosperity of the masses.

Since Indonesia followed a model similar to that of its North Eastern neighbours, the three parts of that strategy need to be examined carefully. A short review of the findings follows below.

7.2.1 Productivity in Java under Suharto

There are two sides to productivity change in Java. Looking over the whole period 1969 to 1996, the development was nothing short of spectacular in terms of yields and returns to labour. Indonesia went from a situation of looming starvation to rice self-sufficiency in about fifteen years. A closer look, however, shows that there were a few of issues which may be alarming. First, although the rice yields increased throughout the period under study, the big increase was limited to only a few years between 1978 and 1982. Thereafter, there was a marked slowdown in productivity and virtual stagnation in the 1990s. Second, with labour productivity, a similar image can be seen. After a stagnant 1970s, there was a sharp increase between 1978 and 1984. While yields kept increasing until the early 1990s, this was not the case with labour productivity, which only increased for a short period of time around 1980. For Java, there is thus evidence of the transformation process stalling in the mid-1980s, particularly in respect to labour productivity.

For Yogyakarta, the area under more careful scrutiny in this study the image is similar. Production rose substantially under the 30 years Suharto was in power, on the other hand, the amount of land assigned to rice was very volatile throughout the period and, if anything, it decreased until the end of the regime.

The development in Yogyakarta mirrored that of Java and showed a substantial increase in the short period between 1978 and 1982. Thereafter there was still an increase but not as fast. In the case of labour productivity the picture in Yogyakarta was a much gloomier one. The intensification programmes of the early 1970s actually increased labour intensity, and decreased labour productivity, and although it recovered in the second half of the decade, nothing much happened until the early 1990s. In conclusion, for Java in general, and for Yogyakarta in particular, increased production was a result of increased yields. With productivity lagging behind, the transformation process stalled and the sector's ability to produce a surplus, which could be reinvested in agriculture or other parts of the economy, was impaired.

7.2.2 Income in Java under Suharto

The agricultural transformation in terms of productivity seems to have stalled in the mid-1980s. In order to get a good overview of rural income from agriculture, a number of variables are looked at. First, the real net income from rice. Despite this variable being highly dependent on yields, it still gives a good indication of the change in farmers' incomes. Although there were a number of other crops grown in Java during Suharto, rice was by far the most important and best suited for this study. Looking at change in income from rice, a clear pattern may be distinguished both for Java and Yogyakarta. From the late 1970s and in the first half of the 1980s there was a great leap in income from rice. Thereafter it kept increasing but at a lower rate and stagnation set in around 1990. This means that the farmers' income from rice changed very little in the last seven to eight years of the Suharto regime.

The second variable of importance in this thesis is the farmers' terms of trade. For Java, not including Yogyakarta, the now familiar pattern was replicated, albeit somewhat later and not so strongly. While the data for this thesis only dates back to 1977, studies from the 1960s and early 1970s indicate that there had been an improvement in terms of trade since the ousting of Sukarno. In the late 1970s the regions of Java, with the exception of the western region, experienced only minor fluctuations. There was a dramatic change in the terms of trade in the early 1980s, but soon thereafter the terms stabilised and apart from a steep drop in the 1990s the terms of trade for rural Java were only about ten per cent higher at the end of the Suharto regime than they had been in 1983. Looking closer at the case of Yogyakarta, this development is not quite as evident. The 1970s experienced little or no change. There was a steep increase in the early 1980s, followed by another trough, although not to the low levels of

the 1970s. After a surge in 1987, there was little change in the last ten years or so of the Suharto regime.
In addition to income from rice and terms of trade, a third aspect is included in the closer study of Yogyakarta, namely real wages in agriculture. In Java, the ratio of landless or near landless in relation to landholders was very high. As a consequence, a large part of the rural population derived its income from wage labour. Although off-farm activities became increasingly important, day labour was still a significant source of income. Looking at the change in real wages, they increased dramatically over the course of the Suharto regime. Again, this increase occurred early on in the development process. In fact, there were only slight changes after 1985.

To conclude, changes in income in agriculture seemed to follow a pattern similar to that of productivity change. Looking over the whole period, great advances were made, but a closer scrutiny reveals that the advancements were limited to quite a short period of time, as the ten years or so leading up to Suharto's down fall showed little improvement.

7.2.3 Equity in Java under Suharto

The third, and final, aspect of the 'East Asian model' of development is equity, which is important for both moral and economic reasons. A more equally distributed growth process will allow for a more efficient use of resources, and promote development as a consequence. Furthermore, equity will feed more equity, improving the situation over time.

A few criteria are used in this thesis to assess equity in the Javanese transformation process. Looking at disparities in expenditure, a clear picture emerges for Java. They were high in the 1970s and thereafter it declined about the same time as productivity and income increased in the early 1980s. Thereafter, equity increased once again for most parts of Java, but West Java and Yogyakarta showed steep increases in the later period. Although different from region to region, there was a clear wave-like trend in the expenditure disparities. Despite this, not too much should be read into these figures since expenditure patterns do not give a very accurate picture of the real situation. They are based on basic needs and the expenditure on these differs little from group to group. In addition, the richest group is often not included. Assets, on the other hand are a more reliable indicator of equity. Accordingly, land holdings have been included here. A careful examination of landholdings in Java shows that there was an increasing polarisation between groups, and increasing gini coefficients. For Yogyakarta, a closer look at the average size of

landholdings shows a wave-like pattern, with an increase in the number of landholders with more than half a hectare increasing between 1973 and 1983. Thereafter, development was reversed. This does not give an indication of the distribution of land, but a more in-depth study of two villages shows that the number of rich farmers did not increase during the Suharto regime. This would indicate that there was a growing disparity in the distribution of land in the 1980s.

In addition to expenditure and landholding, poverty reduction and regional GDP are included in the analysis. This is done in an attempt to include not just regional differences but also those between rural and urban areas. The regional GDP shows that all regions except Central Java, which moved away from the average after 1983, converged. Thereafter, there was a divergence again, while Central Java moved towards the average. It thus shows the wave-like pattern similar to that of the other indicators. Data on income disparities between the regions have a few shortcomings. It shows the aggregate income in the regions butdoes not include differences between sectors.

Turning to poverty reduction in Java, it is clear that there was a significant reduction, both in absolute and relative terms, during the Suharto regime. With regard to equity, however, there are a few issues which need to be highlighted. From 1970 to 1976, poverty in rural areas increased by 25 percent, while urban poverty decreased, leading to a widening of the poverty gap between rural and urban areas. From 1976 until 1981, at the height of the intensification programmes, rural poverty decreased substantially and did so at a faster rate than in urban areas, thus catching up somewhat. This trend was not to last. After 1981, poverty reduction in rural areas slowed down but all the while urban poverty continued to decrease at a steady pace. By the end of the Suharto regime, poverty was still substantially higher in rural than in urban areas. This is not unusual in Third World countries. What is interesting in this study is that the changes more or less coincide with the time periods when productivity and income increased and thereafter slowed down.

7.3 The forces behind the change

From the discussion above it is clear that Java underwent an agricultural transformation. The island made significant improvements in agricultural productivity and agricultural income, but equity did not enjoy similar success. Although there were improvements it is clear that distribution remained uneven. This was particularly the case in landholdings, which increased in polarisation in

rural Java. Another alarming fact is that, despite Java making significant headway in the transformation process, progress slowed down remarkably after 1985. The modernisation process seemed to stall. In order to understand the slowdown in the transformation process, this thesis looks at the driving forces behind the modernisation process.

In the Javanese case, there were two forces which could drive the transformation forward (i.e. the state and the farmer). These two actors operated with economic considerations, but may have had other non-economic motives. The farmer may have put safety before profit and the state could have had considerations other the rural good.

7.3.1 The driving force

In the Javanese case it is quite clear that the state was the dominant factor in the transformation of agriculture in the 1970s. With the green revolution that spread through Asia in the 1960s and 1970s, new technology was made available to enable Indonesia to achieve the goal of self-sufficiency in rice, which had already been set up by Sukarno. The modern technologies made available through the green revolution were, despite their many advantages, a riskier option as they were more vulnerable to pests and vermin and were more expensive. This meant, as argued by Scott, that farmers living close to the subsistence level could not afford to modernise. These farmers had motives other than profits when deciding on crops and cultivation methods, and had so much more to lose if a harvest went wrong. As a consequence, the majority of farmers in Java could not, drive the modernisation process at this stage of development. This was evident under the Sukarno regime, when fertilisers and seeds were made available but were not commonly used.

With the new regime, a mass guidance system for agricultural modernisation was put in motion. There had been efforts in this direction in the past, but nothing on such a large scale as the intensification programmes under the New Order, which offered the farmers a package of seeds, fertilisers, and pesticides. These inputs were heavily subsidised making it a viable option for all farmers regardless of economic stature. The farmers were offered the option of buying the inputs on credit, repayable after harvest, as well as guidance on how to use the new technology.

Finally, there was a certain amount of coercion through, among other things, peer pressure. The intensification programmes managed to create an institutional framework that could lower risks and costs and thereby offset the ‘moral economy’ of the past and make the farmers adopt new technology.

All in all, there were four consecutive programmes, each building on the experiences of the previous one. The programmes had a gradual success rate which can partly be attributed to the increasingly efficient control mechanism of the regime. Another explanation is that, contrary to the ideas of Geertz and Boeke, the farmers were not against change and modernity. Quite the opposite; when new technology gave greater returns without the risk, most farmers embraced the change. In Java, the state, through demonstrations and with the help of gradual adoption by the more entrepreneurial farmers, managed to create an image of the new seeds as a better alternative. When farmers were given the option to switch from one rice type to another, it was much easier in the later stages of the programmes. In addition, many farmers' fields had problems with pests in the late 1970s and, hence, the risk of an older variety was higher than the switch to a new one. Again it was evident that risk was a decisive factor in the process of change, this time working in favour of the regime.

If the state is the driving force behind modernisation, its motives need to be carefully scrutinised as these will have an impact on the development path chosen. As mentioned above, one of the top priorities of the Suharto regime was to achieve self-sufficiency in rice, and later in food. In order to achieve this, the regime made an effort to increase yields drastically. According to the theory of induced innovation, the modernisation process in agriculture is decided by the relative scarcity of land and labour. In Java, when the Indonesian government set out to achieve rice self-sufficiency, labour was abundant and land scarce. Hence, it was not surprising that the regime put emphasis on biological and chemical technologies to replace land, the scarce factor. Doing so meant that Indonesia followed in the footsteps of Japan and other countries in North East Asia. This finding is not very controversial. What is odd is that after the surge in productivity, seen in the late 1970s and early 1980s, the process more or less stopped in its tracks before increasing at a slower rate. Why did it stop? There may have been exogenous reasons why it stopped, but looking at the motives of the state gives a very interesting explanation.

Indonesia achieved self-sufficiency in rice in 1984. Since Sukarno, rice had been politics. It could be argued that his failure to provide food for the people led to his downfall and Suharto was almost toppled from power in the wake of a rice crisis in the early 1970s. As a result, the intensification programmes were given top priority, in other words, it became important to provide the urban population with food in order to stay in power. This is clearly manifested in the fact that intensification programmes in Java were aimed at the farmers not for their sake but rather to provide food for the growing urban population. With the goal achieved, the state was no longer the same driving force behind

modernisation and it slowed down. This is not to say that the state did not maintain its influence in the sector since the programmes continued until the end of the regime.

As discussed above, the development path in agriculture was twofold. In Japan and other first tier NIC countries, labour replacing strategies became increasingly important. In Java, this development could also be seen but it is interesting to note that it was not done by the state. Labour productivity increase in Java was instead a result of individual farmers' mechanising. The mechanisation that did occur was a result of rich farmers buying tractors from abroad in the 1970s. The masses, on the other hand, did not have access to these unless they were closely related to the pioneers. In the mid-1980s there was a slight change in attitude from the state, as there were demonstrations and, in some cases, special credit schemes for the farmers groups to enable them to buy one or two tractors to share among 80 farmers. As news of the benefits spread, more and more farmers wanted to use them but only the affluent could invest in their own. In comparison with the immense efforts put into increasing the adoption rate of biological and chemical technologies, the mechanisation schemes were but a drop in the ocean. Although the demand was there, the result was that mechanisation was slow and the driving force in the transformation process shifted from the state to a few wealthy farmers. The state had helped in setting up 'safety first' principles to guide the poor farmers in the case of land-augmenting technologies, but this was not seen in the case of machinery, leading to the poor masses lagging behind.

We now turn back to the motives of the state. In the East Asian countries, the state had not been involved in mechanisation either, but the income of the farmers had been increased to a level where they could purchase the tractors themselves. In the Javanese case, this was not the case. Although increased rural income was on the agenda, it was second to production. Of course, income did increase, but again it did so only in the first half of the 1980s. Thereafter, agricultural income from rice and for day labourers levelled out. This is, perhaps, not so surprising as the state did not maintain the rice price at the floor price, as agreed upon, causing the farmers income to decrease. At the same time, the real price of rice in Indonesia steadily declined throughout the Suharto regime. It was thus important to provide the urban population with cheap rice and it was done at the expense of the rural producers, therefore not helping in building a rural base for modernisation.

There were diversification programmes in place in Java from the late 1970s and onwards, but these were not carried out with particular gusto and the land

under rice, in relation to other crops, increased steadily. Fruit and vegetable seeds were handed out to the farmers but with little instructions on how to use them, resulting in only the richer farmers fully realising the potential of the crops. Furthermore, the handouts were based on the amount of land the farmer owned and thus had an adverse effect on the distribution of income.

Since the state was the only source of information for the farmers, they were at the mercy of its decisions. Some farmers tell stories of how they wanted to grow other crops but got little help or support from the local PPL officers. Again, the state failed to build a broad base of affluent farmers to drive development.

The final, and also most telling, evidence of the regime's attitude towards farmers' income was the case of sugar. Throughout the Suharto regime the farmers living in wet rice areas were more or less forced to grow sugar under the TRI programmes. They had to do this despite the increased work load and lower income. From the mid 1970s and onwards the price of sugar cane declined steadily. In the early 1990s there was an increase but not to previous levels. Why then was sugar so important? From 1974 sugar was added to the list of crops for self-sufficiency, yet it was a commodity primarily consumed by the urban population. The rural population thus suffered to provide the urban population with sugar.

In conclusion, as the state was the most influential force behind agricultural development in Java, its actions need to be carefully studied. It is clear that increasing income in agriculture, despite being important rhetorically, was not at the top of the development agenda. Instead, it seems as if cheap food was of greater concern. The end result was that a majority of the farmers did not have an agricultural income high enough to be able to save or invest in agricultural production. Although the farmers' income was elevated in the Suharto era, the modernisation process had not created a broad base of farmers who could lead development forward.

Finally, the last leg of the Indonesian development model, and the core of the East Asian one, was equity. From the discussion above it is evident that the state was the principal driving force behind the development in Javanese agriculture. Even though the state officially subscribed to increased production and income for the farmers, this is highly questioned. This also had implications for distribution.

When intensification programmes gained momentum in the late 1970s, the distribution of expenditures improved. As discussed above, that was primarily a consequence of the state ensuring that every farmer was a part of the effort to increase production. The poor were forced into a new technological paradigm

and hindered the affluent from rushing ahead. The farmers were enticed, and sometimes coerced, into using new technologies regardless of affluence. This led to a broad-based adoption of new technologies and the rich farmers could not increase the gap between them and the poor. As a result, expenditure disparities shrunk, but that was not the primary purpose of the state. Yet, this was the time when the state had the chance to create that large group of farmers who could lead the modernisation process of Javanese agriculture forwards, as had been the case in Japan and the other NIC countries. In the second phase, when mechanisation became necessary, the state did not continue its efforts and, as a consequence, disparities increased again.

As noted above, expenditure disparities are not a very good measurement of inequality. A more telling indicator is landholdings. The state clearly did not have much interest in redistribution of land. On the contrary, the Suharto regime did everything but overturn the land reform initiated by the Sukarno regime. The foundation of the 'East Asian Model' had been to distribute land more evenly through land reform. In Java, land was given back to families who had lost their land as a result of the land reform. The end result was that Java, under Suharto, became increasingly polarised, although there was a slowing down for a while in the mid-1980s. Land reform was at the heart of the 'Asian development model' and created a rural class of landholders. This class was the foundation of agricultural development, yet it was of no importance to the New Order.

To conclude, the urban elites thus allied themselves with the local elites, fortifying existing village structures, but failing to create a broad base for sustainable development and modernisation of the Javanese agricultural sector.

7.3.2 Involution or urban bias

In the past it was argued that the decline of the agricultural sector was a result of the sector itself being unable to change. The farmers did everything to maintain the status quo and the economy involuted with diminishing returns to labour and a stagnating sector as a result. It has been proven by White, among others, that this was not the case, but it would be tempting to resort to the same explanation when looking at the collapse of the economy in 1997. This thesis shows that Javanese agriculture went through an impressive transformation process in the 1970s and early 1980s, which then stalled. The driving force behind this modernisation process was the state. The motives of the state, on the one hand, seemingly pro-rural, were very much pro-urban. Self-sufficiency in rice was a strategy of political survival, but once it had been achieved in the mid 1980s the rural sector lost its importance.

It could be argued that the modernisation process in Indonesia had little to do with public opinion and more to do with the international oil price. It is true that the windfall income, created by the oil crisis, presented the regime with new opportunities, but the response to the rice shortages in 1972 were already well under way by the time oil prices increased. Similarly, the oil price began to fall in the first years of the 1980s, while the slow-down in the agricultural transformation process occurred a few years later. Arguably, the the oil price was a factor in policy-making in Indonesia, but as seen above, why was there not more done to improve on and build a broad base for agricultural development when there was a chance? Had this been done, the oil money would not have been needed in the transformation process. As it was, the second phase of development, with increased labour productivity through mechanisation, was driven by a few affluent farmers and not by the state. Hence it was much slower. That the process was driven by farmers shows that they were interested in change, but since agricultural policy had focused on production rather than income and equity, a majority of the farmers were not in a position to mechanise their production. Instead most were in a situation where 'safety first' was the principal motto. The regime thus failed to create a rural class for a broad-based mechanisation and the modernisation process was left to a small landed elite. The elite increased its landholdings and the number of small landholders increased, resulting in a widening gap in rural Java. When the regime acted on the demands from urban groups, agriculture was not an important sector. As a consequence, the development process stalled, and rural Java could not face an economic downturn such as the crisis of 1997.

7.4 Epilogue

It was the economic crisis in Indonesia in 1997 which made the present author question the 'Indonesian development model'. This means that it is the development under the Suharto regime which is the main interest and therefore the study ends with the crisis. With the end of one regime and the beginning of a new one, Indonesia, in 1998, was faced with many challenges but also opportunities. In 1999, Indonesia embarked on a decentralisation process, gradually handing over both political and fiscal power to the regions (Firman 2003). From the farmers' testimonies (Farmer 5. Bantul, 2006), it is evident that the end of the Suharto regime meant greater freedom, but also a lot more volatile conditions with increasing production and living costs. This thesis has shown that the transformation project in Javanese agriculture was significant, but that it

stalled in the latter half of the 1980s. It would be very interesting to continue this thesis to the present time and assess the decentralisation project in terms of its ability to bring improvement to the people and how it stimulates agricultural transformation. In the very last years of the Suharto regime it was evident that mechanisation in Yogyakarta had increased. What happened to this trend after the shift in regimes? In addition, did the new freedom of decentralisation and the abolition of the intensification programmes lead to greater choice for the farmers in what crops to grow, especially as there was no broad base for a transformation process? This thesis has argued that the state played a crucial role in the development process and freedom from this was not necessarily a good thing for those who lived too close to the subsistence level. It would be interesting to see if inequality has increased as a result of the elites gaining more power over the poor masses, but that is a topic which deserves a study of its own without the focus on the Suharto regime.

On a final note, in recent years the president of Indonesia, Susilo Bambang Yuduyono, has on several occasions talked about self-sufficiency in rice and other crops. He has referred to the old programmes and looks back at them with positive memories. He argues that self-sufficiency in rice will give the country greater security and provide work opportunities for the poor (Antara News 2007). At the same time, little is said about land reforms, despite farmers demonstrating in Jakarta. It seems as if the new regime is moving in the same direction as the old one (Jakarta Post 2005). This indicates that the interests of the rural population are not at the heart of policy and that the focus is on urban needs. If the present regime walk down the same path as Suharto did, it is questionable if a sustainable agricultural sector can be achieved. In order to succeed in the long run, Susilo Bambang Yuduhyono will have to create a broad foundation of affluent farmers. It is with that base of farmers that prosperity can come to all sectors of the economy and Indonesia can follow in the footsteps of its East Asian peers.

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In this study, the respondents' identities are protected. Although the information is not sensitive as such, the author promised the farmers confidentiality. This way the farmers were freer in their discussion as they knew no harm would come to them. The New Order regime may have fallen, but that does not mean that the old power structures fell with it.

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Farmer 1, Bantul, April 2006
Farmer 2, Bantul, April 2006
Farmer 3, Bantul, April 2006
Farmer 4, Bantul, April 2006
Farmer 5, Bantul, April 2006
Farmer 7, Bantul, April 2006
Farmer 3, Bantul, June 2004

Gunung Kidul:
Farmer 1, Gunung Kidul, March 2006
Farmer 2, Gunung Kidul, March 2006
Farmer 6, Gunung Kidul, March 2006
Farmer 8, Gunung Kidul, March 2006
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