

**An investigation into the options and prospects of family farming in  
South Africa: Implications for agricultural policy**

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## **DECLARATION**

**I, the undersigned, hereby declare that the work contained in this thesis is my own original work and has not previously been submitted in its entirety or in part at any university for a degree.**

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## ABSTRACT

In South Africa the racial and agricultural policies aimed at national food self-sufficiency created an agricultural structure dominated by large, mechanised farms that are owned and operated by a small number of individuals or companies. New agricultural policy should therefore focus more on peasant farming in the subsistence sector in order to promote the development of sustainable small-scale farming units. The liberalisation of agricultural markets resulted in a fundamental change of political and economic framework conditions for the commercial agricultural sector. Failure to adapt has led to significant inefficiency and financial problems in commercial agriculture.

This thesis initially focuses on the general question of the efficient organisational form of agriculture. With reference to the German agricultural structure, family farming will be identified as a superior organisational form and the utility optimal factor allocation of this organisational form is explained with the aid of the agricultural household theory.

South Africa's agricultural structure is marked by extreme dualism, which was caused by political intervention in the labour and capital markets. The current liberal agricultural policy framework makes commercial agriculture in particular seem inefficient and gives reason to question the current organisational form of South African agriculture.

Besides the basic socio-political objectives, the growth objective is one of the most important factors in the development of subsistence agriculture. The contribution of agriculture is not restricted to food production. In fact, the factor contribution is important in achieving economic growth, especially in developing countries.

Future developments in the South African agricultural sector will be strongly influenced by the international market. In this respect South Africa, Germany and many other Western industrialised countries are undergoing a similar transformation process that corresponds with the spatial agricultural land use in location theory. Location rent implies differing costs for the use of land, and this is the case for the development of different agricultural systems depending on their distance from the market. The family farming model can be considered as having failed in the South African economy, except in some niche markets. The number of family farms is in fact growing, but there is also a tendency towards more large-scale industrialised agricultural units.

The subsistence sector will remain dominated by family farming in the future, although the agricultural household represents a kind of survival institution in these areas. Despite all problems in the subsistence sector, there is no alternative to family farming, and development of subsistence farming is only foreseeable within the framework of family farming. Subsistence farming as a social security system could, however, decline in importance in the future.

## OPSOMMING

In Suid-Afrika het die klem op voedselselfversorging, wat voortgevoel het uit rasse- en landbou-beleidsrigtings, veroorsaak dat die landbou struktureel gedomineer is deur groot, hoogs gemeganiseerde plase wat besit en bedryf is deur 'n klein aantal individue of maatskappye. Die fokus van landboubeleid in die toekoms behoort dus te wees op kleinboere om te verseker dat 'n volhoubare struktuur van klein plase daargestel word. Hierdie verandering moet gepaard gaan met die proses van liberalisering van die landbousektor, wat fundamentele veranderings in die bedryomgewing van die sektor teweeg gebring het. Tot op datum het die gebrek aan vordering hiermee verskeie probleme in die kommersiële sektor tot gevolg gehad.

Hierdie studie begin met die algemene vraag oor die struktuur van 'n doeltreffende landboustelsel, dus die doeltreffende organisasievorm. Die ondervinding van die Duitse landbou word gebruik om te wys op die relatiewe doeltreffendheid van die familieboerdery as kern vorm. Die teorie van die huishouding word gebruik om te wys op die beter vermoë van familieboerdery om hulpbronne optimaal te allokeer.

Politiese inmenging in die kapitaal en arbeidsmarkte het aanleiding gegee tot 'n hoë mate van dualisme in die Suid-Afrikaanse landbousektor. Die bestaande liberale beleid het ook verskeie ondoeltreffendhede in die kommersiële sektor ontbloot, en dus is daar 'n groter bevraagtekening van die huidige organisasievorms in die sektor.

Die doelwit van groei bly een van die belangrikste doelwitte in die landbou, ten spyte van die heersende klem op basiese sosio-politiese doelstellings. Die bydrae van die landbou streek verder as bloot voedselverskaffing, en sluit ook in verskeie ander faktorbydraes, veral in ontwikkelende lande.

Verdere ontwikkelings in die Suid-Afrikaanse landbou sal sterk beïnvloed word deur veranderings in die wêreldmark. In hierdie opsig is Suid-Afrika besig om dieselfde soort van transformasie te ondergaan as lande soos Duitsland en ander van die nywerheidslande. Die sterkste invloed sal na verwagting gevoel word in terme van die ligging van landbou-produksie. Die implikasie is dat afstand van die mark al hoe meer belangrik gaan word in besluite oor die optimale organisasievorm. In hierdie opsig het Suid-Afrika 'n agterstand as gevolg van die gebrek aan aandag vir die ontwikkeling van volhoubare familieboerderye. Ten spyte hiervan groei die aantal familieboerderye teselfdertyd as die groei in die aantal groot korporatiewe plase, hoofsaaklik as gevolg van die oor-aanbod van arbeid. Die

verwagting is dat familiboerdery sal bly domineer in die bestaanssektor, al het dit meer die aard van 'n laaste uitweg aangeneem vir baie gesinne. Ten spyte van sy probleme, is daar geen alternatiewe organisasievorm in die ontwikkelende landbou wat ook kan bydra tot die sukses van die sektor nie. Die verwagting is egter ook dat familieboerdery as sosiale verskynsel sal afneem in belangrikheid.

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**LIST OF ABBREVIATIONS**

ACB	Agricultural Credit Board
AG	Aktiengesellschaft [ <i>joint stock company</i> ]
Cf.	compare
DM	Deutsche Mark [ <i>German Mark</i> ]
EC	European Community
Ed.	Editor
EU	European Union
GbR	Gesellschaft bürgerlichen Rechts [ <i>association under the civil code</i> ]
GDP	Gross Domestic Product
GDR	German Democratic Republic
GmbH	Gesellschaft mit beschränkter Haftung [ <i>private company of limited liability</i> ]
LPG	Landwirtschaftl. Produktionsgenossenschaften [ <i>agric. production co-operative</i> ]
LRP	Land Reform Programme
LRPP	Land Reform Pilot Programme
LSU	Large Stock Unit
Mil.	Million
NGO	Non-Government Organisation
No.	Number
R	Rand
RSA	Republic of South Africa
SA	South Africa
SAAU	South African Agricultural Union
SACU	South African Customs Union
SADC	Southern African Development Community
Vol.	Volume
VG	Volkseigenes Gut [ <i>state farm</i> ]
WTO	World Trade Organisation

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the study

Underdevelopment in rural areas and inefficiency in the agricultural sector can have a variety of causes. Most often they result from the organisational structure of agriculture and the relationship between the state and the agricultural sector. Organisational structure is influenced by history, tradition, legislation, natural conditions and domestic agricultural policy.

The main distinguishable organisational forms for agriculture world-wide are family farming, collective farming, subsistence farming and various different forms of large-scale farming, including plantation agriculture and the *latifundia* of South America.

Agriculture in Western Europe and North America is characterised by highly capitalised small-scale farming. As a general rule the enterprises have only as many agricultural resources at their disposal as they can manage. The size of these family farms differs from region to region according to the various locally determined focal points of production. Depending on technological progress and capital flows, a tendency towards larger units of production can be observed.

In the former socialist countries of Central and Eastern Europe, a collectivisation or nationalisation of agriculture took place through the creation of state and co-operative farms. The aim was a centrally steered, large-scale, planned economy that would benefit from economies of scale. The state enterprise is similar to a co-operative farming enterprise.

Large-scale agriculture that is dependent on hired labour has also developed in capitalistic environments. Such enterprises are characterised by modern and efficient mass production. In the feudal systems of Europe and India during the 18th and 19th centuries large-scale farming in the form of landlord estates developed. In Latin America such estates, the so-called *haciendas*, still exist today.

A special form of large-scale production is plantation agriculture. Historically it was highly dependent on slavery. Today's plantations in South America, Africa and Asia



benefit from economies of scale. It is not so much the production but rather the marketing of some tropical fruit which relies heavily on economies of scale.

Another form of agriculture, which is by no means insignificant, is subsistence farming. In many African countries it is the predominant form and often linked to communal and/or traditional land rights. Subsistence farming is a form of family farming in which the focus lies on the production of food for household consumption.

The different forms of agriculture have adapted to the economy or the agricultural policy framework of particular regions or states. During the past decade, a trend towards regionalisation and polarisation of economic activities has occurred. Trade arrangements such as those brought about by the European Union (EU) and the North American Free Trade Agreement (NAFTA) have had an increased influence on the structure and the performance of the agricultural sector. There is a trend within the affected regions to harmonise economic and rural instruments, institutions and policies. The national government's influence over domestic agricultural and economic policy is declining. The national agricultural sector is becoming increasingly subordinate to the common agricultural policy of the relevant regional agreements. This can have a serious socio-economic impact on local agriculture, as can be seen from the past experiences of the common agricultural policy (CAP) in the EU.

Global trade in agricultural products has increased over the past two decades because of decreasing trade barriers and transport costs. The Marrakech agreement that concluded GATT's most recent Round of negotiations in 1992 saw the conclusion of the first substantive agreement concerning the liberalisation of trade in agricultural products. The agreement will result in a gradual reduction of trade barriers. Individual states and trade blocs with highly protected domestic agriculture must allow greater entry into their markets.

The liberalisation of global trade in agricultural products leads to an increase in competition on the domestic agricultural market. This results in lower consumer prices but also in increased competition on the producer side. In some states or regions of the world, this leads to a dramatic change in the agricultural production structure, with far-reaching socio-economic effects on agricultural areas.

In light of this, the current agricultural policies of many countries must be questioned. Arguments in favour of the support of national agriculture such as food self-sufficiency and food security in times of crisis appear dubious because most forms of market

protection result in significant welfare losses. An interventionist environment tends to lead to an inequitable distribution and creates production structures characterised by inefficiency.

Countries with a high degree of discrimination against agriculture have experienced the lowest rates of economic growth and *vice versa*. In many African countries the absolute contribution of the agricultural sector to the economy is decreasing. In these regions some of the poorest developing countries of today can be found, whereas the agricultural sectors of the countries in Latin America and South East Asia are experiencing rapid growth.

## 1.2. Problem statement

As a result of the change in South Africa's political and protectionist framework, commercial agriculture has experienced significant efficiency problems. The basis on which the commercial sub-sector was built has been changed and may change further in the future. Furthermore, the new policy pays much more attention to the peasant sub-sector because it is seen to have economic potential as well as being a source of rural employment. The purpose in this study is to try and determine the most efficient organisational form for agriculture in general, and also to enquire whether the South African agricultural structure is developing towards the most factor-efficient organisation within the different agricultural sub-sectors.

Thus the main question addressed here is: Is the South African government doing the right things to create and facilitate a framework for a more efficient organisation in agriculture?

## 1.3 Motivation

In the course of the past 50 years South African agriculture has developed into an extremely dualistic production structure, although historically agriculture was virtually homogenous. White agriculture developed into large-scale surplus-producing commercial agriculture, while black agriculture developed into a deficit-producing peasant sector. This was, however, largely caused by the South African government. In the mid-eighties a liberalisation of agricultural policy was introduced, since the economic losses of agricultural protection greatly exceeded their benefit. With the change of power in South Africa, the political and economic isolation was removed and the country opened up to international markets. The increasing international integration and the rigorous

liberalisation of South Africa's agricultural policies led to a crisis in commercial agriculture. The results of the decades-long racist policies, inequitable land distribution and underdevelopment of the black agricultural sector are causing additional problems. A general structural change in agriculture as well as a re-thinking of policy objectives seems to be necessary.

Many countries experience similar problems as a consequence of the liberalisation of their agricultural markets. Not only in South Africa, but also in the EU there is a search for an efficient agricultural structure. The remaining question for many countries is: in which direction should agriculture be adjusted, and how must the agricultural and economic policies be shaped so that the agricultural sector attains factor-efficient performance? The development of rural areas and the economic welfare of the rural population depends on agricultural policy in many countries.

Further research in the South African as well as the international context is necessary to identify the national or regional optimal organisational form in agriculture to enable maximal contribution to the welfare of a country. This is not only important to know for the economic participants within the agricultural sector with a view to the decision-making process and investment planning, but is also of central importance for the setting of objectives in agricultural policy.

Agricultural policy has to create the framework conditions for agriculture and influences the processes within the agricultural sector through structural and market policies. For selective and goal-orientated implementation of structural policy measures, it is essential to know the deficiencies of the agricultural sector and the trends in domestic and international agriculture.

A misdirected policy in the commercial agricultural sector can only be revised with significant economic losses, especially considering the importance of the agricultural sector for the South African economy. In the subsistence sector government programmes that do not conform to the objectives or that are not administered well enough, not only waste the limited budgetary means but also prevent the objective of development from being reached.

In order to identify family farming as the dominant organisational form in agriculture, German agriculture was chosen as an example since there are interesting parallels between the German and the South African agricultural structure.

On the one hand, the country's agricultural sector is dominated by family farming but on the other hand, a large-scale production structure exists in Eastern Germany. Both

agricultural sectors compete within the CAP of the EU. Since the latest WTO agreement, family farming in West Germany has been experiencing considerable problems of competition and East German agriculture had to be transformed from a planned economy to a market economy. The experience gained in the transformation of German agriculture could be of valuable assistance in the transformation of South African agriculture. The competition between two opposite agricultural organisational forms - family farming and large-scale agriculture – in the one economy and under the same policy conditions is informative for agricultural development initiatives and is thus particularly suitable for a comparison with South African agriculture within the context of this thesis.

Furthermore, the excellent statistics available for German agriculture facilitate the determination of development trends and tendencies and help to explain the reasons for the dominance of family farming in its various forms.

The family farming system is applied to South African agriculture in the context of this thesis because it has been by far the most dominant and successful organisational form in agriculture in many countries for decades.

#### **1.4 Methodology and use of data**

This study is based on a literature study of the general welfare theory, household theory and the standard work on location theory.

Chapters two and five of this thesis are predominantly descriptive in nature, while chapters three and four contain a more analytical, argumentative approach. The last part (chapter seven) initially contains some prognoses and then chapter eight puts forward some proposals for the formation of agricultural policy.

In the theoretical part of this thesis (chapter two) the explanations are based on the generally available literature on economic theory. Publications by the British writer LOW (1986) and the Japanese writer NAKAJIMA (1986) have been referred to quite extensively. The structure of economic policy objectives was obtained by referring to a variety of textbooks concerning agricultural economics.

Statistics used to explain German agriculture in the second part of this thesis are taken mainly from the respective volumes of the annual reports on agriculture of the German government and several German discussion papers on the issue of family farming.

In chapter seven and eight of this thesis predominantly South African literature was used. For the analysis of the current developments and policies in South African agriculture,

numerous discussion documents as well as conference publications of renowned South African agricultural economists were used.

Within the context of the analysis in the final part of this thesis, detailed agricultural statistics, especially relating to the land market, would have been very useful in order to provide better substantiation for the forecasts and hypotheses concerning developmental tendencies. But because such statistics are lacking for South African agriculture, location theory and comparisons with German agriculture were employed instead.

### **1.5 Organisation of the study**

This study consists of four general parts: (1) Farm household theory; (2) Advantages of a family farming system; (3) Historical framework conditions in South African agriculture; and (4) A family farm-based agricultural future in South Africa.

The introduction is followed by the second chapter which provides an illustration of the household theory as a model of the rural economy. It contains an introduction to the theory's fundamental principles and household equilibrium, which is deduced from it. The effects of factor variations on the household equilibrium are explained with the aid of graphic representations. Then, two approaches to the household theory are compared and their relevance to the South African context is tested.

Chapter three aims to illustrate the characteristic elements of the structure of agriculture in Germany. Particular attention is paid to the economic and social environment of the agricultural sector and its micro-units, namely households. The structural organisation and in particular the transformation of East German agriculture is investigated.

The following chapter contains an analysis of the reasons for the dominance of family farming in German agriculture. Full- and part-time farming are analysed further in terms of competitiveness and also compared to each other as well as to other organisational forms in agriculture.

Chapter five discusses why South African agriculture has deviated from the original format of family farming. The historical framework conditions that have contributed significantly to South Africa's agricultural structure are highlighted. The main emphasis lies on the effects of state intervention on the labour and capital markets as well as on the legislative measures.

Chapter six attempts to illustrate the socio-political objectives in general. Using basic socio-political objectives, the objectives of agricultural and economic policy are derived. The explanation of the contribution of agriculture to the economy concludes the section on economic policy objectives.

Furthermore, the primary effects of the liberalisation of the agricultural market are set out and the probable development of the structural organisation in South Africa's agriculture is forecasted and substantiated. A distinction is made between the subsistence sector and those production positions which are close to and those which are removed from the market. This is followed by a comparison of the trends of development in South African agriculture. In conclusion, the possibilities for a family-based farm structure in South African agriculture are indicated.

The last chapter questions the agricultural policy of the new South African government and points out some deficiencies in the current implementation of the Land Reform Programme. This leads to a few recommendations for correction of agricultural policy and for the setting of primary objectives concerning state intervention in the South African agricultural sector.

**PART ONE**  
**FARM HOUSEHOLD THEORY**

## CHAPTER TWO

### HOUSEHOLD THEORY AS A MODEL OF THE RURAL ECONOMY

#### 2.1 Introduction

Agriculture is seldom analysed on the basis of household theory, although the theory is suited to the quantification and qualification of the objectives of agricultural production, especially in the field of subsistence farming. The relative efficiency of part-time farming and its usually high household income - compared to full-time farming - is for example underestimated by the classical process of enterprise analysis. This often leads to incorrect conclusions concerning the economy of part-time and small-scale farming.

Viewing production or enterprise structures in the light of aspects of the household theory is not a new instrument of economic analysis. The microeconomic elements of agricultural household theory can be found in HICKS's (1939) representation of the theory of a firm. The agricultural household theory primarily analyses data concerned with utility maximisation of the individual economic unit. This is in contrast to the objectives of maximisation in terms of the classical HICKS Theory. Economic and allocative decisions of the agricultural household as they exist in most family farming operations should mainly be seen in the light of utility maximisation.

The development of Asian agriculture, which is characterised by small-scale farming, has had a great deal of influence on household theory. The agricultural and development policies of Japan and Indonesia have in the past been centred on the fundamentals of household theory. Knowledge of development theory as well as household theory has contributed to the development of agriculture and the successful industrialisation of Japan in particular (HAYAMI et al. 1975 and CRAWCOUR 1969).

This chapter contains a discussion of the classical household theory. This will mainly be explained with the aid of graphs since this facilitates comprehension. Mathematical argumentation is only necessary in a few instances. In the first half of this chapter fundamental aspects of the agricultural household as an economic unit are explained. This will be followed by a textbook explanation of the household theory. The theory can be deduced from the microeconomic base of the utility function. Special attention will be



paid to the effects of quantitative variation of external factors on the equilibrium of the household and the allocation of their inputs.

The last part of the chapter contains an explanation of classical household theory in connection with agriculture in South Africa. Furthermore, the validity of commercially-based assumptions is critically assessed. In order to be able to analyse important factors of the household decision, an additional model is included. This is suitable especially for the analysis of the subsistence-farming households in Africa.

## **2.2 Development of the household theory**

The farm household theory developed from general economic theory during the past 50 years, a process in which mainly Japanese economists were involved. The neo-classical theory sees the farm household as an economic unit of enterprise and household with the objective of utility maximisation.

The original idea of the theory of the farm household can be traced back to the Russian economist TSCHAJANOW (1923 & 1927). His household theory, which preceded COASE's (1937) transaction costs approach, offers some possible explanations for the dominance of family enterprises. After World War II TSCHAJANOW's ideas were taken up by two Japanese theorists, OTSUKI (1941) and TANAKA (1951), who further developed them and then eventually published them as a modern economic theory. Their household theory is based on HICKS's assessment of the consumer's household and the firm.

Although later publications differ in their representation of the farm household, the crux of the household theory remains unchanged. HUFFMAN (1976&1976b) employed the farm household theory to average American family farms in order to examine the value of time and its allocation separately for farm wives and husbands. LOW (1986) shows that classical household theory is not applicable to the subsistence production sector, especially not if the basic assumptions such as decreasing marginal productivity are not fulfilled. He expands the household theory for the subsistence production sector and shows the determinants of the allocation decision of such non-market production households. BECKER (1965, 1981) widens the applicability of the economic theory of choice on the non-market area to analyses the social aspects of a farm household in detail. He expands the theory of choice' utility for the analysis of household action in its various dimensions and analyses different aspects of the family in order to explain the families' modern forms of appearance and action.

### 2.3 The farm household

Every person or group of persons that takes economic decisions can be described as an economic subject. Basically the differentiation is between household and firm. Households are regarded as economic units that did not originate exclusively with economic objectives and are not organised around these. The main objective is the satisfaction of the needs of its members. The economic activities of economic subjects which fall under the category of firms are, on the other hand aimed at making a profit (HENRICHSMEYER et al. 1993).

An agricultural enterprise usually represents an intermediary between households and firms. A classic farm household exists on family farms and in the subsistence farming sector. In agriculture the farm household is the economic, social, organisational and productive union of household and enterprise. Production is made up of the agricultural enterprise as well as from household production.

Household production consists of the production of goods such as vegetables and clothing as well as services such as laundering and food preparation. The household does not maximise its utility from purchased goods only, as is assumed in traditional consumption theory. BECKER (1965) introduced the z-good approach to household economics. Z-goods are produced by the household using household resources (time) and market goods as input factors for the households' production function. Full money income can be achieved by the allocation of all household resources to off-farm income. This takes into account that time can be converted into goods through money income and also accounts for substitutions between money and psychic income (VINK 1986)

The basic elements of BECKER's (1965) z-good approach are: goods are not the immediate object of welfare; household members' time is an input in the household production function and household resources can be converted into market commodities by selling time to the labour market.

Goods and services are produced or prepared for the household's own consumption as well as for sale. The members of the household have utility maximisation as their objective. They have freedom of choice concerning the choice of consumer goods and the disposition of their input factors and correspondingly distribute family labour and land according to production for the household and the enterprise (HENRICHSMEYER & WITZKE 1994). The income of the individual family members contributes towards household income and, consequently, towards wealth. Income is consumed communally in the household and

thus, in a sense, has a “collective” character, which is expressed in different ways. In industrialised countries farm households show growing economic independence from individual members, whereas in developing countries - especially in subsistence farming systems - the economic unit of the household has existential meaning.

The farm household is the social centre of its members. It offers its members protection from illness and age. The household performs the function of social insurance which, because of transactional advantages such as limited opportunistic behaviour and full information, is more effective than it might be in the case of external provision. The fact that narrow ties of relationship exist between members of the household leads to limited opportunistic behaviour. This is essentially what makes the social structure of the farm household so stable (POLLAK 1985).

#### **2.4 Classification of organisational forms in agriculture**

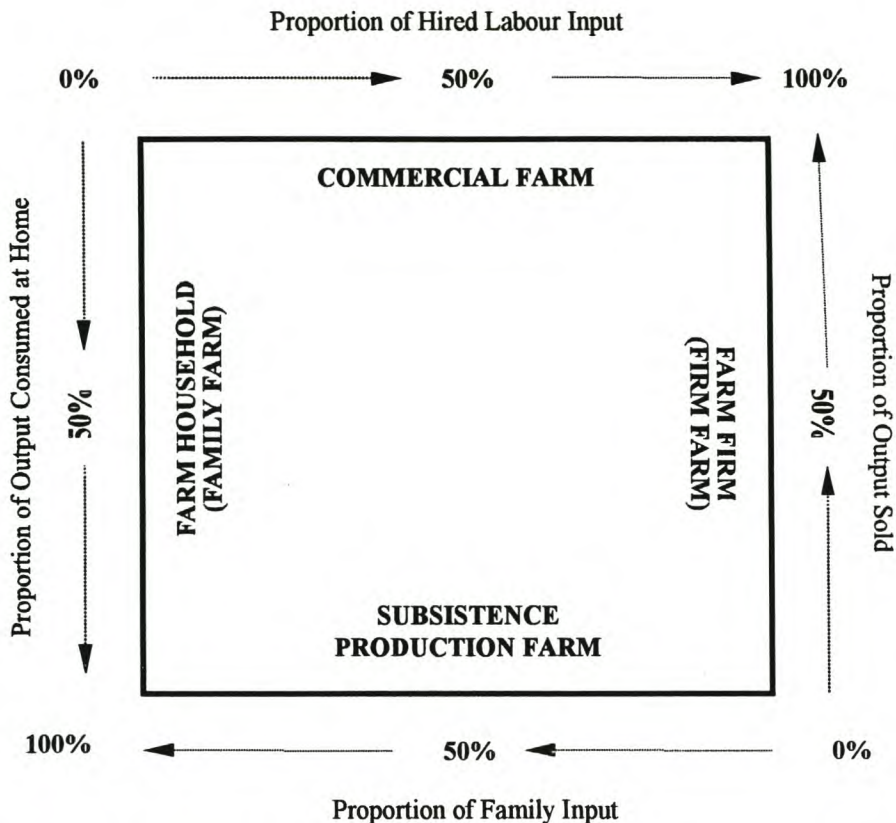
Agricultural production and its organisational forms are very diverse. In no other sector is the disparity between the different forms of enterprises and within the individual groups as great as it is in agriculture. A rough classification of the organisational forms can be made with the help of the characteristics labour and proportion of self-consumption. NAKAJIMA (1986) divides the organisational forms into four groups<sup>1</sup> according to these features.

In Figure 2-1 opposite organisational forms are shown facing one another. Commercial and subsistence production farms are different from each other because of the output factor “proportion of production sold”, whereas the difference between farm firm and family farm lies in the input factor “labour”.

In reality, these types of farms do not exist in a pure form. Mixed forms are most common. Commercial and subsistence farms often also differ from each other because of the input factor labour, which means that subsistence farm production and family farms need to be placed in the lower left-hand corner, while commercial and firm farms belong in the upper right-hand corner.

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<sup>1</sup> The Eastern European type of collective agriculture cannot be sufficiently characterised with the aid of the features “labour” and “proportion of self-consumption”. This is because the allocation and distribution of the input and output factors are centrally directed. Therefore, it is not the result of individual utility or the market.

**Figure 2-1: Organisational forms in agriculture**

Source: NAKAJIMA (1986)

A third axis with the criterion of the origin of income can be added to the model to expand and improve the characterisation of the household, or rather, the farm firm. In the case of the family farm as well as the subsistence production farm, this would correspond with the agricultural and the non-agricultural income (off-farm wage employment). However, in the case of a farm firm and a commercial farm, the axis would actually take income from different branches of operation. These may also include income from non-agricultural activities.

In the industrialised countries of the northern hemisphere, the interweaving of enterprise and household in agriculture has decreased since the farm is increasingly seen as a business. The share that household consumption has of the output is declining in importance. To an increasing extent, the household should be seen as the social organisational form in which income is consumed communally.

In agriculture, however, there is usually a unity of household and operations, so that it becomes difficult to observe the enterprise in isolation from the household. One of the reasons is that agriculture is often dominated by individual private enterprises. In addition

to this, the labour force in most of these enterprises is usually provided by the entrepreneur's family (BRANDES & WOERMANN, 1969). A further explanation for the strong interdependence of income and consumption lies in the fact that workplace and home are usually not separated from each other.

## **2.5 The concept of utility maximisation**

The household as an economic subject reacts in different ways to events in the economy. Various models are used to study the market situations and the decisions which households have to make as a result of environmental factors. However, the household cannot be described comprehensively by means of the different models of enterprises. Therefore, the following considerations relate to the fundamental determining factors of the demand for goods and the supply of factors as well as the existing interrelations.

The decisions reached by private households are determined by the objective of achieving the best possible satisfaction of their (subjective) needs. In the economic sense, this corresponds with individual utility maximisation. The basic equipment of the household is considered to be all physical stock of the factors land, labour and capital<sup>2</sup> and the rates of payment for factors of production as well as the prices of consumption goods.

While making decisions, households must determine to what extent factor outputs should be offered at given levels of payment and what part of the income should be used for the purchase of particular consumption goods. When the household has determined to what extent it intends to use its factors, the only remaining decision is the optimal sum of consumption at given prices so that needs can be satisfied as effectively as possible (HENRICHSMEYER et al. 1991). Preferences or conceptions of utility in the household play an important role in decision-making on the purchase of consumption goods. In the microtheory a distinction is made between the concepts of cardinal and ordinal measures of utility. The cardinal measure of utility can be used to explain the demand for consumer goods in the household, but this requires the assumption that utility can be quantitatively measured. The concept of indifference curves involves fewer far-reaching requirements. The household must only be able to state whether it prefers one basket of goods to another, or if one basket of goods is equivalent to another (HICKS 1939).

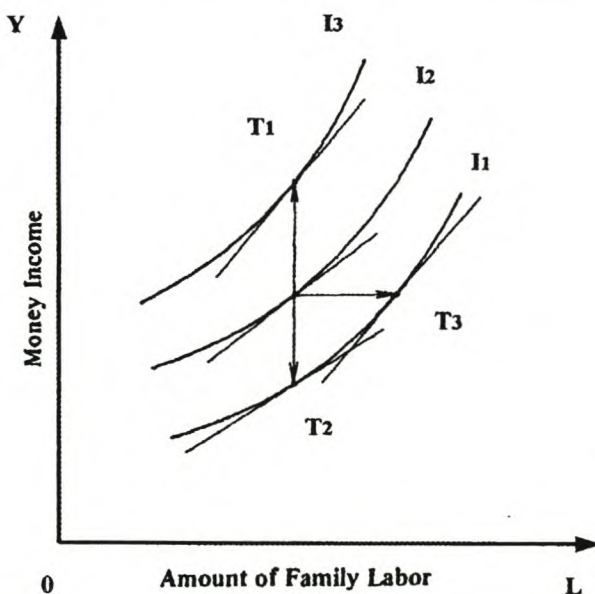
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<sup>2</sup> In modern households, claims in terms of participation in partnerships, companies and fixed deposits are also considered to be physical stock.

In the following reflection, the use of income must be disregarded. The allocation or rather the extent of allocation of household production factors is important when explaining the concept of ordinal utility. The utility of a household can, in simplified terms, be seen as a function of labour [L] and income [Y]. In economic terms this is the same as the utility function  $U=U(L,Y)$ . It is assumed that  $U_L < 0$  and  $U_Y > 0$  because labour brings direct disutility due to the physical and mental pain. The negative value ( $-U_L$ ) can be interpreted as the marginal pain of labour.

In a conventional case indifference curves are graphs of equal utility, i.e. the household would give the same rating to different combinations of labour and income on the indifference curve. Graphs that are further away from the origin provide a greater degree of utility.<sup>3</sup> The differential of the utility function  $[\delta Y/\delta L]$  is the limit rate of the substitution of income and labour at the specific point. This can also be interpreted as the marginal value of labour.

**Figure 2-2: Utility functions of a household**



Source: NAKAJIMA (1986)

In figure 2-2 the horizontal axis represents the amount of family labour and the vertical axis represents the amount of money income. The explanation of the positive slope of the indifference curves in figure 2-2 is as follows. For the total differential of the utility

<sup>3</sup> The concept of indifference curves are based on further assumptions. They have a negative slope and never touch or intersect.

function,  $U=U(L,Y)$ , one obtains  $\delta U=UL*\delta L+UY*\delta Y$ . Since the utility level of every point along the particular indifference curve is the same and constant, it can be equated to zero. It follows that the slope of the indifference curve  $[\delta Y/\delta L]$  is represented by  $[-UL/UY]$ . Because of the assumption of a negative utility of work, the term  $[-UL/UY]$  is positive and the indifference curve therefore slopes upwards.

In the real world, the activities of a household are far more complex and are not only determined by the factor labour and income. Furthermore, households cannot be regarded as a homogenous group since, on a microeconomic level, the consumption decisions of individuals differ from one another. Nonetheless, the utility principle effectively describes the actions of households. The model can thus be used as a basis for more detailed observations concerning the allocation and distribution effects within a household.

## 2.6 The subjective equilibrium of a farm household in a basic model

A farm household is an economic entity which is a combination of the farm firm, the labourer's household and the consumer's household. The economic activities of the farm household and its decision-making behaviour are based on the economic theory of utility maximisation. Subjective equilibrium, stability conditions and effects of parameter changes can be explained by means of that theory (HICKS 1939; MARSHALL 1936). However, the concept of economic surplus has been included in the second part of this paragraph in order to illustrate household decisions more clearly.<sup>4</sup>

A simple model of the subjective equilibrium of a farm household only works under the following assumptions:

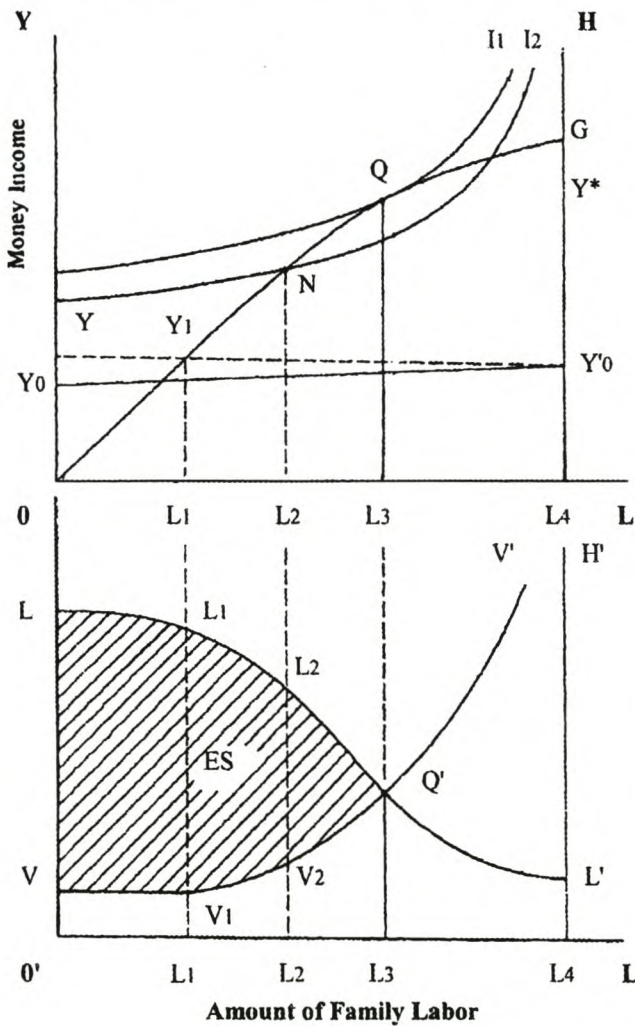
1. The household owns only the production factors land and labour.
2. The household produces homogenous goods. All goods produced are sold on the market.
3. The production factor land is seen as fixed and it is in the possession of the household. A land market does not exist.

<sup>4</sup> HICKS's (1939) theory shows stability criteria and market equilibrants from which subjective equilibrium and market equilibrium can be deduced. MARSHALL, on the other hand, rather analyses economic surplus, which is deduced from the cost utility theory.

4. A labour market does not exist. The household can only employ family labour on the farm.
5. There is no seasonality in farm production.
6. The farm household earns no off-farm income.

The farm household modelled in terms of these assumptions can be characterised as perfectly self-employed, purely commercial and owner-operated.

**Figure 2-3: Subjective equilibrium in a basic model**



Source: NAKAJIMA (1986)

The horizontal axis of figure 2-3 measures the amount of family labour [L] and the vertical axis the money income of the farm household [Y]. The line L<sub>4</sub>H represents the limit of the physical input of labour of the farm household and the horizontal graph Y<sub>0</sub> Y'<sub>0</sub> indicates



the minimum subsistence income of the household. This income is necessary to provide for the minimum costs of living of the family. The graph shows a slight upward trend since the livelihood needs of the household increase along with an increase in the input of labour.

The upward-sloping curve  $OG$  represents the household income as dependent on the input of labour. It can also be measured in monetary units as a household production curve.<sup>5</sup> The curve originates in the origin  $[0]$  and, with a decreasing marginal yield  $[\delta L/\delta Y]$ , approaches the physical limit of labour input  $[L_4H]$ , which it intersects at the point  $G$ . The production function of the household runs in accordance with the law of diminishing returns, which occurs especially in agricultural primary production.<sup>6</sup>

If the farm household has profit maximisation as its goal, it would employ family labour until the physical limit  $L_4H$  is reached. Furthermore, it would earn an income of the amount indicated by the graph  $L_4G$ . Since utility and not profit maximisation is the household's primary objective, point  $Q$  and not point  $G$  represents the extent of household production. At point  $Q$ , the indifference curve  $I_1$  touches the income curve  $OG$ . This point is thus the point at which utility is maximised.<sup>7</sup> The household will therefore employ the production factor labour to the extent indicated by  $L_3$  and consequently earn an income of  $Y^*$ .

The line  $L_3L_4$  corresponds with the quantity of labour that is not put to use in order to gain income. This can be regarded as the leisure time of the household, since the extent to which labour is employed was individually determined by the indifference curve of the household.

The lower half of figure 2-3 illustrates the relevance of point  $Q$  for the household. The graph  $LL'$  is the first derivative of graph  $OG$  (the marginal subjective valuation of family labour), while  $VV'$  is the first derivative of the indifference curve  $I_1$  after work (the marginal value product of family labour). The graphs intersect at  $Q'$ , which means that the equilibrium conditions of the household are met.

<sup>5</sup> In terms of the microtheory the curve corresponds with the product of the market price of the produced goods  $P(x)$  and the extent of labour  $[f(L)]$  which also equals wages  $[W]$ .

<sup>6</sup> In the past several authors have confirmed the general validity of the laws of yield concerning agricultural as well as commercial production. One of the first of these was the German national economist VON THÜNEN (1783-1850) who, in his book "*Der isolierte Staat*" [*The isolated state*] illustrated the situation by way of an example taken from agricultural production.

<sup>7</sup> At point  $Q$  the gradient of the production function  $OG$  equals that of the indifference curve  $I_1$ . This means that the marginal value product of family labour  $[P(x) f(L)]$  is equal to the marginal valuation of family labour  $[-UL/UY]$ . Thus,  $Q$  is the result of the maximisation of the utility function and is also the subjective point of equilibrium of the farm household.

The area under the respective graphs is equal to the farm household income [LQ'L30'] or the subjective costs of family labour [VQ'L30']. Subtracting the areas from each other gives the shaded area ES<sup>8</sup>, which represents the maximised economic surplus of the farm household. At point Q' the maximised economic surplus equals zero, since farm household income and subjective costs of labour are equal. Moving along at the right of point Q', the economic surplus is negative since the leisure of the household is valued higher than the yield from further employment of labour.

## 2.7 Effects of parameter changes on the subjective equilibrium of the farm household in the basic model

The explanation of the household model featured above was made under restrictions such as the non-existence of a labour market as well as the assumption that all factors are fixed. In reality this would never be the case. A farm household is influenced by fluctuations in producer as well as consumer prices. A labour market is also almost always present. The following section describes the effects that changes in the most important factors have on the subjective equilibrium as well as the extent to which the farm household employs labour.

### 2.7.1 The effects of a change in product price

Once again the basic model is that of a farm household with the input of labour [L] on the horizontal and income [Y] on the vertical axis. In Figure 2-4 the production curve [0G<sub>0</sub>] and the indifference curve I<sub>0</sub> are given. At Q the farm household is in subjective equilibrium with an employment of labour of L<sub>2</sub>.

Now the product price [P(x)] for the good produced by the household increases, *ceteris paribus*.<sup>9</sup> Because of the higher yield, the production curve 0G<sub>0</sub> becomes steeper and intersects the physical limit of labour LH at G<sub>3</sub>. The indifference curve I<sub>1</sub> touches the new production function 0G<sub>3</sub> at the point R. This is the new point of subjective equilibrium of the household.<sup>10</sup>

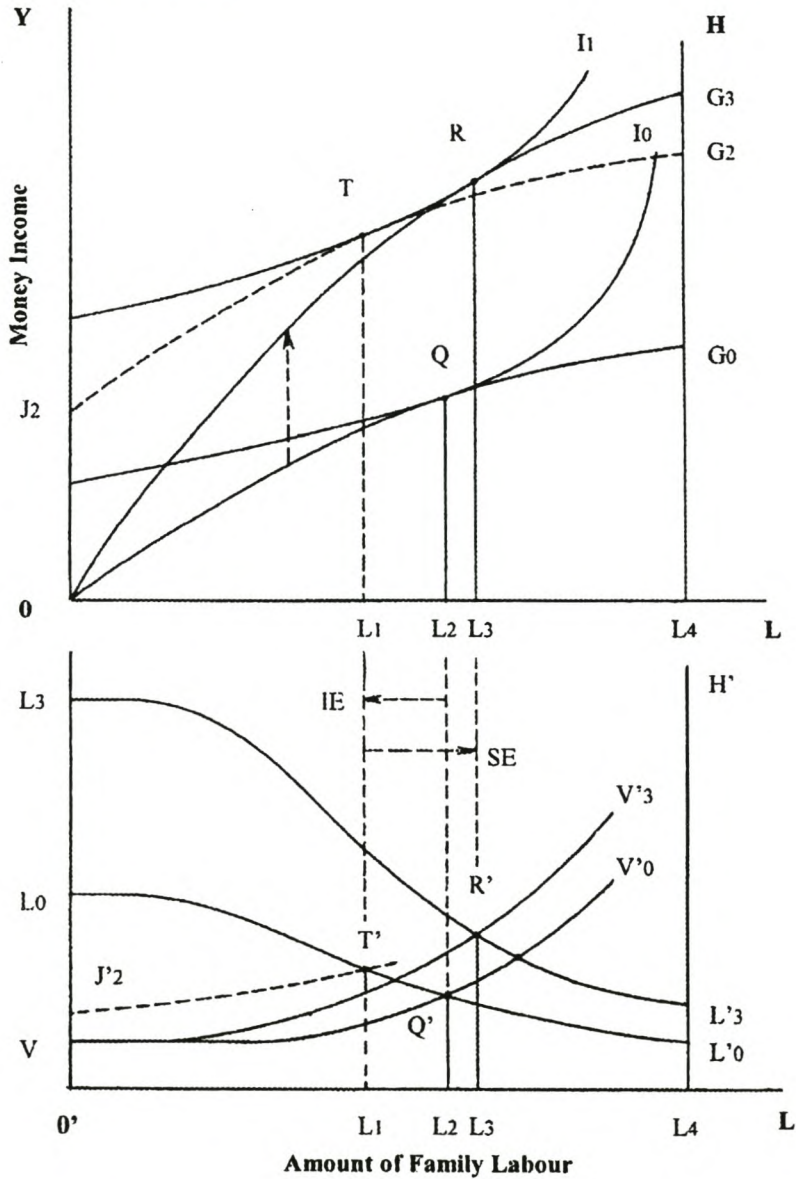
<sup>8</sup> The area can be determined by  $\int_{L_1}^{\sigma} f''(P(x))fL - \int_{L_1}^{\sigma} f''(f(L,Y))$ .

<sup>9</sup> A lowering of the product price will not be explained in detail as the effects are exactly opposite.

<sup>10</sup> An increase in the producer price results in an income and a substitution effect respectively. These, as a rule, have opposite effects. With "normal goods", the substitution effect dominates the income effect so that the net effect (price effect) is positive. HICKS, SLUBSKY and GIFFON have developed different criteria according to which goods are classified as "normal", "inferior" and "Giffon" goods.

The price increase effects an increased employment of labour by the household for purposes of agricultural production. The employment of labour increases by the line  $L_2L_3$  and leisure time decreases by the same amount. The marginal yield of family labour increases if a price increase occurs and it leads to more employment of family labour.

**Figure 2-4: Effect of a changing product price on the subjective equilibrium of a farm household**



Source: NAKAJIMA (1986)

### 2.7.2 The effect of an asset-income rise

Asset income is an income which is independent from agricultural production but which has an effect on factor allocation by the farm household.<sup>11</sup> A rise in asset income causes an upward, parallel shift of the production function  $OG_0$  in figure 2-4 by the amount of income. The new function  $J_2G_2$  intersects the indifference curve  $I_1$  at the point of subjective equilibrium which is T. The employment of family labour decreases to the line  $OL_1$ . The effect on work allocation differs depending on whether an increase in asset income or a price increase has occurred. In both cases, however, household income and the marginal value product of family labour increase. An increase in asset income causes a shift of the household's subjective equilibrium from Q to T and the extent of labour is reduced (income effect). A price increase results in a shift of the household equilibrium from Q to R and the extent of labour increases (price effect).

Furthermore, the lower part of figure 2-4 shows that the equilibrium value of the marginal value product of family labour increases from  $Q'L_2$  to  $T'L_1$  due to the asset-income effect, and increases from  $T'L_1$  to  $R'L_3$  due to the substitution effect (NAKAJIMA 1986).

### 2.7.3 Effects of a change in land

Free expansion of the factor land results in an increase in the relative productivity of family labour [L]. The output, measured in monetary units per employed unit of labour [Y], increases. This implies that the area productivity decreases.

Similar to the situation where the product price increases, the production curve  $OG_0$  becomes steeper and the point of subjective equilibrium, Q, shifts upwards to the right. Leisure time is reduced as family labour is increased in favour of agricultural production.

## 2.8 The farm household and a labour market

The farm household is free to employ family labour either in household production or alternatively in off-farm employment. In the primary model of the farm household it has to be assumed, that household production is primarily an agricultural activity while the off-

<sup>11</sup> Examples of asset-income in agriculture are the varied subsidies (area assistance, bull premiums) that exist in the European Union. However, a household can also obtain asset-income that is independent of agricultural production in the form of social security or children's allowances.

farm employment is a non-agricultural activity. Here, the determinants of labour allocation play an important role.

In the second part of the observation, the farm household model is to be expanded in terms of the possibility of the employment of hired labour in agricultural production. This is aimed at explaining the relationship between hired labour, family labour and off-farm work.

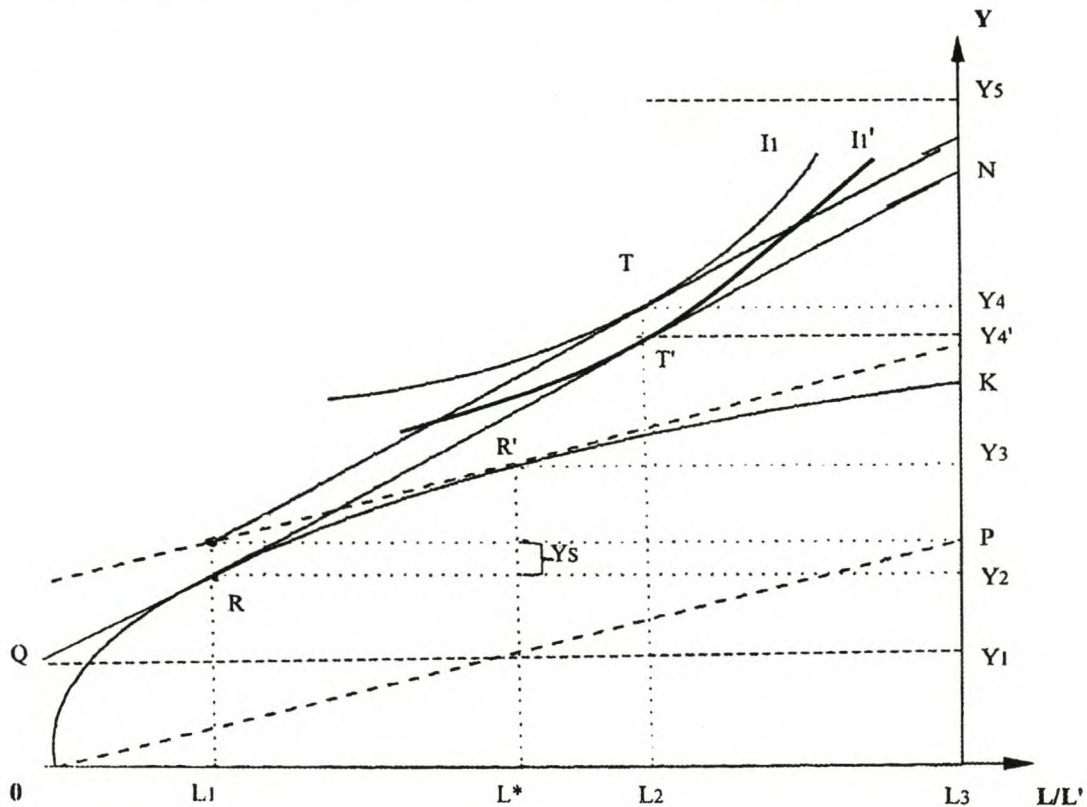
### 2.8.1 Family labour and off-farm work

In the basic model of the household, the production function  $OK$  runs from the origin  $[0]$  towards the physical limit of labour  $[L_3]$ , while its marginal productivity decreases. The abscissa represents the household income  $[Y]$  and the horizontal axis measures the total employment measured in monetary units. This, in turn, corresponds with off-farm wages  $[W]$ .<sup>12</sup>

If the production function  $QN$  is shifted upwards until it meets the agricultural production function  $OK$  in its tangential point  $R$ , the rate of employment of family labour in agricultural production  $[Lag]$  and in off-farm production  $[LW]$  is obtained. At point  $T'$  the indifference curve  $I_1'$  separates off-farm work from leisure time. The farm household employs its labour to the household production according to line segment  $OL_1$  and off-farm to the extent of the line segment  $L_1L_2$ , which generates a total income of  $Y_4'$ . The total working time amounts to  $OL_2$  and leisure time is represented by the segment  $L_2L_3$ . Point  $R$  marks the extent of agricultural production and therefore also the size of the agricultural enterprise. At point  $R$  the gradient of the production function  $OK$  equals that of the wage graph  $QN$ . This implies the same marginal productivity of labour. As long as  $\delta Y/\delta Lag > W$ , the household employs its labour force in household production. However, as soon as  $W < \delta Y/\delta Lag$ , the household will put its labour to use in an alternative activity.

The household generates income from two different sources -  $Y_4'$  represents the total income, the line  $0Y_2$  originates from agricultural production and the rest  $Y_4'-Y_2$  is from the alternative off-farm employment.

<sup>12</sup> The model assumes that off-farm employment is not subject to the laws of yield. In fact, marginal productivity of labour  $[\delta Y/\delta L']$  must be the same. In practice, this can often be observed in the case of wage employment since there, the hours worked determine the wages.

**Figure 2-5: The farm household model and the labour market**

Source: SCHMITT et al. (1995).

### 2.8.2 Family labour and hired labour

The household model shown in figure 2-5 will now be expanded by the factor hired labour. Now hired labour competes against family labour. The line  $OP$  represents the wage function of the hired labour. It must be assumed that the marginal wages of hired labour are lower than the marginal wages of family labour and that marginal wages are constant in both cases.

If the graph  $OP$  is shifted until it reaches the outermost point of the production function  $OK$ , the point  $R'$  or rather  $L^*$  marks the employment of labour in agriculture as well as the new size of the enterprise (SCHMITT 1992, 1996d & SCHMITT et al. 1995). The line graph  $QN$  must be seen as the opportunity cost of the family labour force since the possibility of employment that is not related to agriculture exists at a wage rate of  $W$ . The opportunity cost of family labour is now higher than the wage rate of hired labour  $[WH]$ . Consequently, the household will substitute family labour with hired labour. Agricultural

production can be expanded to the point R' since the labour costs of hired labour are lower than those of family labour.

The household's income from agricultural production is  $Y_3$ . From this, the wages of the hired labour  $Y_1$  must be paid. Thus, the household is left with a net income of  $Y_1Y_3$  (NAKAJIMA 1986). This income can also be regarded as the land rent if household production is primarily concerned with cultivation.

The household can earn additional income by employing the family labour force  $OL_1$  that was previously used in agriculture in other areas not related to it. This additional or substitute income equals the difference of the marginal product of the functions QN and OP. This income is graphically illustrated by the section  $Y_s$  in figure 2-5. The total income from off-farm wage employment  $Y_4$  is met by the indifference curve  $I_1$  and the point T.

If the household is rational, the whole family labour  $L_2$  will be allocated to wage employment and the agricultural production will be run with hired labour. The household achieves an off-farm income equal to the line  $Y_1Y_4$  and a net income of  $Y_1Y_3$  from the agricultural production, which amounts to a total household income of  $Y_5$ . The extent to which family labour is substituted by wage labour in agricultural production depends on the marginal product of labour and the wage rate of labour.<sup>13</sup>

## 2.9 A farm household approach to Southern Africa

The preceding discussion served the purpose of explaining the classical household theory of OTSUKI (1941) and TAMAKA (1951). Their theory is based on the concept of subjective equilibrium, which explains the allocation decisions in a poor commercial household.

In the following sections the conventional model will be applied to commercial farming in SA and the theory's limitations in terms of the Southern African subsistence farming sector will be pointed out and an alternative approach to the farm household theory will be introduced.

<sup>13</sup> When  $\delta Y/\delta L_{ag} > W > W_H$ , family labour is substituted in full and agricultural production is expanded slightly. When  $\delta Y/\delta L_{ag} > W_H > W$ , family labour is only partly substituted by hired labour and when  $W_H > \delta Y/\delta L_{ag} > W$ , no hired labour is employed in agricultural production.

### 2.9.1 Commercial farming in SA and the household theory

Commercial farming in SA is dominated by hired labour. It often happens that part of the family labour force is allocated to off-farm activities. In contrast to European commercial agriculture, white farmers in South Africa hire labourers rather than use their own family labour.

The household model discussed so far and especially the illustrations of the farm household and the labour market in paragraph 2.8 can be used to show, using the preference functions, why white farmers hire labour rather than use family labour.

In SA there has been and is still an oversupply of cheap agricultural labour. White farm household members usually have a better education than the average hired labourer and therefore the potential to get a better paid job outside agriculture is much higher for them. This implies that the opportunity costs of farm work are higher for the family members than for hired labourers. Applying the model of the farm household and the labour market in figure 2-5 to the South African situation on the labour market, the allocation decision in commercial agriculture is clearly reflected.

As explained in paragraph 2.8.2, the line OP represents the cost of hired labour and the graph QN must be seen as the opportunity costs of the family labour force, since the possibility of employment that is not related to agriculture exists at a wage rate of W. The opportunity cost of family labour is now higher than the wage rate of hired labour, which indicates the steeper gradient of the QN line. Consequently, the household will substitute family labour with hired labour. In practice agricultural production can be expanded since the labour costs of hired labour are lower than those of family labour.

The use of hired labour rather than family labour favoured in South African commercial agriculture is the consequence of a relative oversupply of cheap agricultural labour and economically rational allocation decisions by the farm household. As long as the marginal product of family labour (opportunity cost) is higher than that of hired labour, white farmers will favour hired labour in agriculture rather than family labour.

### 2.9.2 The current farm household theory and its limitations in terms of traditional farming systems in Southern Africa

OTSUKI (1941) and TAMAKA (1951) describe a purely commercial farm household. In their model the household income is measured in monetary units on the vertical axis. This



implies that the household sells all products or, alternatively, that a market for these exists. Thus the farm household is considered to be run with commercial objectives in mind. A market exists for the produce and family labourers can use the labour market as a source of income. The model thus presents a purely commercial family farm as it exists in industrialised countries. For several reasons a model of this kind cannot be applied to indigenous farming in Southern Africa.

Firstly, a considerable proportion of the time of farm households is taken up by non-market activities.<sup>14</sup> The classical model cannot distinguish between the time allocation for non-market activities and market activities. Furthermore, it is not clear from the model what share of the production occurs for the market and what share is for self-consumption. For both surplus as well as deficit producers, the market price is the determining factor in the allocation of family labour in either agriculture or in off-farm wage work. The price of subsistence products differs according to whether one buys or sells. This is not taken into account by the classical household model. In Southern Africa, where a high proportion of farm households are deficit producers who purchase a part of their subsistence food requirements, this is an important aspect of production and consumption, especially in the movement from deficit to surplus production and vice versa (*cf.* appendix 1).<sup>15</sup>

Secondly, the classical theory assumes that land area is fixed at the level of the farm household and that this results in declining returns as more labour is employed on the family farm. Many empirical investigations in Southern Africa have shown that - at least until a certain level - the farm size increases along with an increased household size (LOW 1986).

There is still a land surplus in the sense that the marginal product of further inputs of labour is constant (HELLEINER 1975). The assumption of declining returns of labour is an essential part of subjective equilibrium models. Since it is also questionable whether off-farm wage rates are fixed and constant, off-farm employment by a part of the family farm labour force can only be explained by declining returns to labour on the farm.

There are disparities in off-farm wage rates between ethnic groups, men and women, and the job opportunities open to young adult males in particular are much more numerous than

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<sup>14</sup> *Cf.* appendix 8.

<sup>15</sup> The difference between purchase and selling price, on the one hand, and the off-farm wage rate, on the other hand, is often the decisive factor in determining whether a country can produce enough food for itself or not. Because this is often not considered to a sufficient extent in development aid,

those available to females (SENTRALE STATISTIEKDIENS 1996). The assumption of fixed and constant wage rates for all household members is thus unrealistic.

The subjective equilibrium-based classical household theory thus has clear limitations in the Southern African context. Its deficiencies are, first, it does not make it possible for market and non-market activities to be analysed within the same model; second, the need to assume decreasing returns to farm labour in order to explain off-farm employment, and third, the relevance of the purchase and the sales prices of subsistence food requirements cannot be taken into account to a sufficient extent.

### 2.9.3 A model of the indigenous farm household in Southern Africa

A model of a semi-subsistence farm household has to be constructed. The household decides on the allocation of family labour to wage employment or whether to combine market inputs and time on the farm to produce subsistence goods. Another possible way in which the need for subsistence goods can be met is by purchasing them directly in a shop. In this case the time necessary for purchasing the products must be ignored so that only market input costs are taken into account. The household member with the largest comparative disadvantage in relation to wage employment will be allocated to subsistence crop production, while the member with a greater advantage in relation to wage employment can specialise in generating income. The household will purchase the subsistence requirements when the following situation exists:

$$P(z) < P(x) * X_i + W_i * T_i \quad i = 1, n$$

In this equation,

$P(z)$  the price for subsistence goods on the retail market

$P(x)$  the price of input X for the production of subsistence goods

$X_i$  the amount of input X required by member  $i$  to produce a unit of subsistence goods

$W_i$  the wage rate of member  $i$

$T_i$  the amount of time required by member  $i$  to produce a unit of subsistence goods

Dividing the equation by  $T_i$ , one obtains:

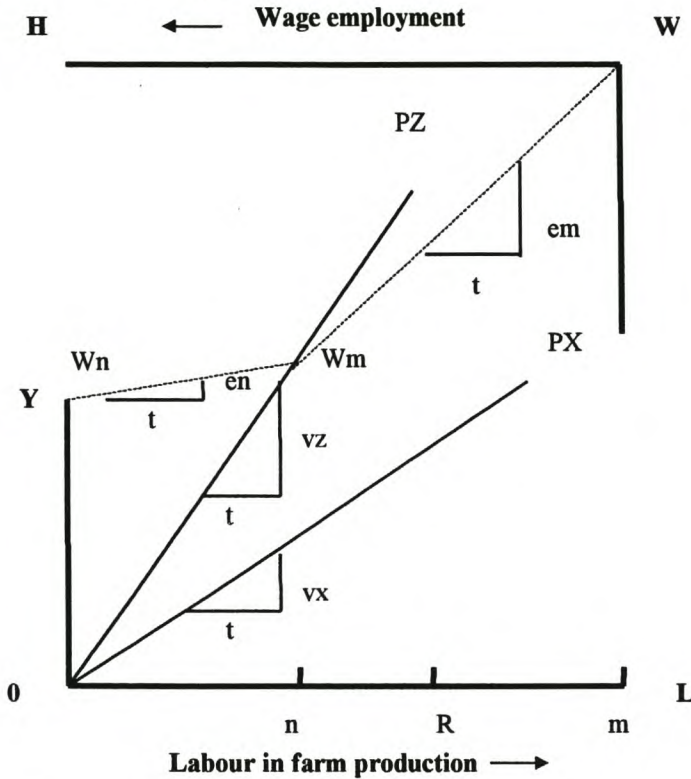
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agricultural development aid projects were often unsuccessful in the past. As long as employment in a non-agricultural sector is more appealing than in agriculture, food production cannot be increased.

$$P(z) - P(x) * X_i/T_i < W_i \quad i = 1, n$$

The time of household members with the greatest comparative disadvantage to wage employment will be allocated to food production until either the household's requirements of

**Figure 2-6: The two-person household: subsistence cropping versus wage employment**



Source: LOW (1986)

subsistence food are satisfied or until the member's wage rate becomes greater than the opportunity costs of purchasing the subsistence food (LOW 1986). In a model of a two-person household, this connection can be illustrated graphically. The bottom horizontal axis [0L] measures labour in farm production. On that axis, 0n represents the labour of the household member n and 0m - 0n is the labour of the member m. The 0Y axis measures market input costs and the PX line represents the market costs of growing the subsistence goods.<sup>16</sup>

<sup>16</sup> In subsistence farming areas of Southern Africa, a traditional land tenure arrangement exists. All members of a chiefdom have free access to land as well as grazing rights. The cultivation of the land is very extensive, which means that few input factors except labour are necessary. Labour is often performed by lowest wage earners or by non-wage earners like school boys where cattle herding is

The WH axis measures the amount of labour employed for wages. The wage-earning potential of each household member is represented by the slope of the  $WW_n$  curve. The line PZ is the retail price of subsistence goods. While the total cost of subsistence goods production is the cost of production PX itself plus the opportunity cost of alternative wage employment W, the household member n can clearly produce subsistence goods more cheaply than the member m can. Thus member n's time is allocated to subsistence food production, while member m is allocated to wage employment.<sup>17</sup>

The slope of the PZ line represents the full costs of obtaining a unit of subsistence crop through the purchase option. If the cost of purchasing the subsistence requirements is lower than the full costs of production of a unit, the household member will purchase its requirements. This is the case with member m, since his costs of production  $[vx+em]$  are higher than the cost of purchasing a unit of subsistence goods  $[vz]$ .

Most indigenous farm households in Southern Africa have more than two members and it is, of course, possible to allocate labour on the farm to generate income by growing crops for the market. The time allocation will therefore depend on the relation between off-farm wage, costs of purchasing the subsistence food requirements and the net return to cash crop farming.

In order to illustrate this connection, the model presented in figure 2-7 serves as the point of departure. The horizontal axis measures labour input in crop production  $[0L]$  and labour units in wage employment  $[WH]$ ; the vertical axis represents the monetary income and costs. The crops that may be grown for the household's own consumption or for sale, the market input costs, commercial returns and opportunity purchase costs are represented by the lines OC, OM and OP respectively.<sup>18</sup> The wage line  $WW'$  is curved - this indicates an increasing comparative advantage in wage employment from left to right.

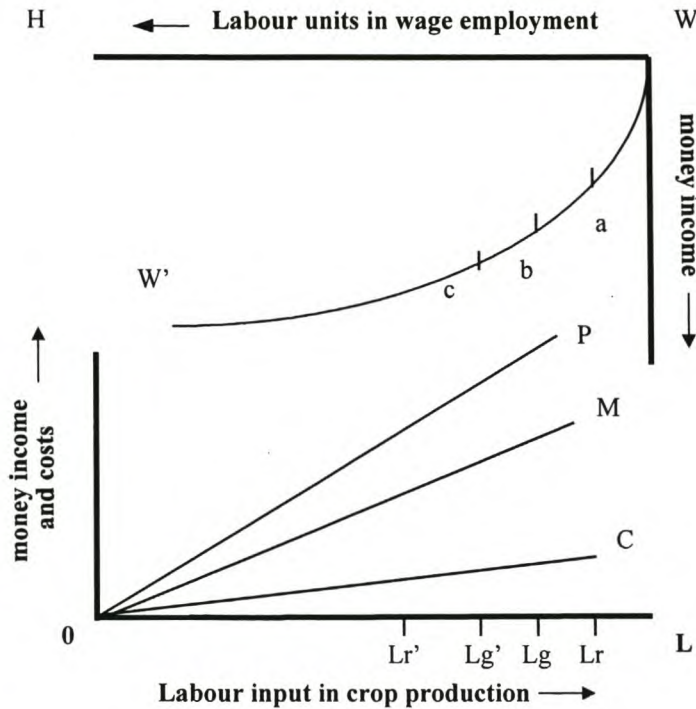
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concerned. The PX line for these goods would have a very small slope, which indicates low production costs.

<sup>17</sup> It is assumed that the production costs of subsistence goods for both household members are equal.

<sup>18</sup> Here, the assumption is that no scale effects occur in agriculture. This is why linear production functions are used. The risk factor is also not taken into account. Since the risk involved in cash crop production is certainly higher than that of wage employment, considering the risk would additionally favour wage employment.

**Figure 2-7: The multi-person household: subsistence and cash cropping versus wage employment**



Source: LOW (1986)

Household X's food requirements can be met by allocating the labour units  $OLr$  to food production on the farm. The alternative wage rate can be determined on the curve  $WW'$  at the point  $a$ . Since the gradient of the purchasing food curve  $OP$  is smaller than the gradient of the wage curve at point  $a$ , the household will allocate labour to wage employment. Only labour to the left of point  $Lg$  will be allocated to subsistence farm production. The household will be a deficit food producer.

The second household Y may be able to cover its subsistence requirements by allocating the labour amount of  $OLr'$  to food production since the  $OP$  line has a greater slope than the  $WW'$  line at that point. The costs of food purchase would be higher than a off-farm wage employment. The household would even employ  $OLg'$  in agricultural production as long as the gradient of the curve  $WW'$  to the left of point  $c$  is smaller than the gradient of the graph  $OM$ , which is the relevant graph for surplus producers. Wage employment would be more favourable for the household if it were to lie to the right of point  $Lg'$ . The household is a surplus producer and sells the quantity  $OLg' - OLr'$  (LOW 1986).

LOW's (1986) model takes the difference between producer and retail prices into account. The labour allocation of individual households between subsistence production, cash crop

production and wage employment can be deduced. It describes the subsistence farm production and the allocation decisions made by households in Southern Africa with greater accuracy than the classical household model.

## 2.10 Summary and results

The agricultural household is the economic union of enterprise and household. As an economic unit it takes household and agricultural production as well as social and economic aspects into account.

The theory is derived from classical utility theory. The household does not aim at maximising its profit as is the case in an enterprise. Instead, the aim is to maximise individual utility. Households can be classified as either commercial or subsistence farms, based on the features “labour” and “proportion of self-consumption”. Commercial farms mostly employ hired labour whereas subsistence farming relies on family labourers.

In the household model, the intersection of the indifference curve and the production function represents subjective equilibrium. The input of family labour and the income from agricultural production can be determined in this way. By means of the subtraction of the derivative of the utility and production function, the economic surplus of agricultural production can be obtained.

External changes - such as a producer price change or a rise in asset income - have different effects on the allocation of family labour. An increase in producer price has a positive effect on the profitability of agriculture and it leads to an increase in the employment of family labour in agricultural production. An increase in asset income has the opposite effect. The subjective value of family labour in agriculture decreases. This, in turn, leads to a reduced level of agricultural production.

When expanding the household model to include the labour market, the relationship between family labour and off-farm work is investigated. As long as the marginal productivity of work in household production is greater than or equal to the wage rate of off-farm labour, the household does not allocate its family labour to an alternative activity. If the marginal wages of hired labour are lower than those of family labour, the rationalising household will substitute family labour with hired labour until their respective marginal products are equal.

There are several reasons why the classical farm household theory has limited application to traditional small farm systems in Southern Africa. It is not possible to analyse market as well as non-market activities in one model if one wants to explain the assumption of decreasing marginal yield of labour as the prerequisite for off-farm work. Also, it does not sufficiently take the purchase or the sales price of subsistence food into consideration.

The household member with the lowest opportunity cost of labour is concerned with subsistence food production. If the costs of purchasing the subsistence requirements are lower than the full costs of production of a unit, the household member will purchase their household requires.

The producer price of food is the decisive factor for surplus or deficit production of food for a household. If the purchase costs of food are lower than the marginal wages of off-farm work, the household will find employment for its labour in off-farm work. However, it is more advantageous for family labour to be employed in the production of foodstuffs until the marginal wages of off-farm work are equal to the marginal product of cash crop farming.

**PART TWO**  
**ADVANTAGE OF A FAMILY FARM SYSTEM**



## CHAPTER THREE

### AN OVERVIEW OF GERMAN AGRICULTURE

#### 3.1 Introduction

The general agricultural conditions in South Africa differ from those in Germany. This is because of the geographical differences, the position of agriculture in the respective economies and the general level of development of these two countries.<sup>19</sup> Germany is rated as one of the seven most important industrialised nations. The agricultural sector contributes only marginally and to a decreasing extent towards the GDP. Although South Africa's agricultural sector is also declining, it still contributes more than 3% to the GDP and provides the main source of income in the rural areas.

Agriculture in Germany is conducted on a commercial basis, without exception. Agricultural production and politics cannot just be considered on a national level as the broader context of the European Union (EU) must be borne in mind. Decisions concerning agricultural policy which affect the production and distribution of agricultural products in individual member states are mostly taken with the whole of Europe in mind (OCKENDEN & FRANKLIN 1995).

This chapter aims to illustrate the characteristic elements of the structure and production of agriculture in Germany. Particular attention will be paid to the economic and social environment of agriculture and its micro-units, households.

The development of the agricultural sector is discussed by a comparison between East and West Germany. More specifically, the present-day position of East German agriculture and the process of transition are investigated. This is done by distinguishing between various forms of organisations in the East German agricultural sector and by comparing certain characteristic data.

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<sup>19</sup> Cf. appendix 9.

Most of the data were taken from the 1999 agricultural report of the German government (*Agrarbericht der Bundesregierung 1999*). This is compiled annually in accordance with agricultural law and is presented to the German parliament.<sup>20</sup>

### 3.2 Structure of enterprises

In 1998 there were approximately 516.300 agricultural enterprises which consisted of more than one hectare of arable land in Germany. Of these, approximately 32.000 were situated in the eastern part<sup>21</sup> and 484.300 in the western part of Germany. The number of enterprises had decreased by 1,7% from the previous year. Classified according to the legal forms, individual agricultural enterprises dominate with a share of 97,2%. Partnerships constitute 1,8% and corporate bodies 1%.

Agricultural enterprises cultivate an area of 17,3 million ha, of which 5,7 million ha are located in East Germany. However, there are considerable differences between the sizes of the various enterprises. In West Germany approximately 15.000 enterprises (thus 2,2% of all enterprises) with more than 100 ha cultivated 15,5% of the entire arable land. In the eastern part, this included 24,2% of all enterprises which had a 93,5% share in the area. The share of enterprises larger than 100 ha has clearly increased by 4% in both east and west, whereas the number of enterprises under 50 ha has decreased.

In 1998, only 41,3% of all individual farm enterprises generate their income exclusively from farming. The smaller enterprises tend to be run by part-time farmers. The average size of full-time farming enterprises is 47,6 ha with 1,7 labourers. They can be subdivided, according to the emphasis of production, into large stock and pasture farming enterprises (62%), cash-cropping enterprises (17%), small stock and cereal farming enterprises (8%), permanent culture enterprises (6%) and mixed enterprises (7%). The average profit of the full-time farming enterprises was between 30.000 (937 DM/ha) and 57.000 DM (1.101 DM/ha) per enterprise in 1998.<sup>22</sup> Only 13,6% of enterprises made a profit of more than 100.000 DM. Without exception, the larger enterprises made greater profits.

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<sup>20</sup> There is an enterprise-testing network which compiles agricultural data in Germany. It collects data from enterprises in all categories and classes, which includes those with as well as those without bookkeeping. The data are collected and evaluated once a year by the Ministry of Agriculture.

<sup>21</sup> The eastern part of Germany is equivalent to the territory of the former German Democratic Republic (GDR).

<sup>22</sup> The SOUTH AFRICAN RESERVE BANK (1998) published an average Rand exchange rate of 3,47 to one DM. However the Rand devalued from 2,72 in January 1998 to 3,54 in December 1998.

In 1998 the profit of part-time farms increased to 11.966 DM per enterprise or 542 DM/ha. If grouped according to size, part-time farms show clear differences in the amount of agricultural profit. Whereas smaller enterprises only managed to attain a profit margin of 6.619 DM per enterprise, larger enterprises attained around 18.528 DM. Part-time enterprises have 27 ha of land as well as 0,9 labourers and 140 LSU per 100 ha.

Part-time farms constitute 60% of all enterprises. They are concentrated in areas with relatively unfavourable natural conditions. On average they cultivate 5 ha and attain a yearly income of 1.000 DM from agricultural activities. Since this income is so low, it can be assumed that the non-agricultural income corresponds to that of the employed person without income from agriculture. The average gross salaries and wages of off-farm employed persons was 51.500 DM in 1998.

As far as the different types of organisations in agriculture are concerned, it can be noted that the most prevalent is a form of partnership, the association under the civil code (*Gesellschaft bürgerlichen Rechtes [GbR]*). These partnerships have an average size of 180 ha. In 1998 they had 3,3 labourers, of whom 2,1 were not remunerated labourers. The average yield per enterprise was approximately 131.000 DM (730 DM/ha) or 52.065 DM/laborer. The partnerships in the eastern part are almost seven times the size of those in Western Germany.

The area owned by corporate bodies<sup>23</sup> was 1.520 ha on average, which is 10% smaller than in the previous year. The corporate bodies made an average profit of 23.325 DM (15 DM/ha) or 41.704 DM/laborer. The average enterprise of this nature has 62 members or partners, of whom only 20 work in the enterprise. In 1998 the number of labourers was approximately 35, constituting a decrease of 16%.

Individual farm enterprises and partnerships (GbR) are mainly situated in the western part of Germany. Almost all of the corporate bodies can be found in eastern Germany. On average the partnerships are almost four times larger in area and corporate bodies are 30 times larger than individual farm enterprises. The latter have a much greater number of labourers per hectare than partnerships or individual farm enterprises.

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<sup>23</sup>

Corporate bodies are predominantly co-operatives, private companies of limited liability and stock companies. They are mainly successors of the former GDR socialist co-operatives and state farms (*Landwirtschaftliche Produktionsgenossenschaften [LPG]*) and *Volkseigene Güter [VVG]*).

### 3.3 Transformation of East German agriculture

The structure of farms changed immediately and rather extensively in the course of the transition in the former GDR. Most of the land (82 %) was previously cultivated by collective farms. The size of these farms differ depending on whether they were predominantly producing crops or farming livestock.

While the number of co-operatives decreased and that of corporate farms increased, the total figure remained remarkably constant. The predominant method of adjustment takes place by changing from a co-operative to a corporate farm. Since the total land cultivated by these farms has declined, their average size has also decreased. In 1992 the combination of these two farm types occupied about 73% of the land that had been cultivated by collective farms in 1989. By 1995 this share was reduced to 63%.

Private farming is on the increase in eastern Germany. This is true of the number of farms as well as the amount of land that is used. A distinctive form of private farming takes place by forming partnerships. These usually take the form of two or three farmers joining forces in doing their farming business. The number of such farms increased dramatically between 1992 and 1995.<sup>24</sup> But their average farm size also shrank substantially - more than that of any of the other farm types.

The best indicator for profitability is comparing the results obtained from adding profit and wages per labour unit. This is highest for partnerships, followed by individual farms, while co-operatives and corporate farms rank last.<sup>25</sup> Corporate farming still takes place under special circumstances. Most commonly, a larger share of their gross revenue is generated by livestock production than is the case for private farmers (FROHBURG 1997).

It is interesting to observe that co-operatives and corporate farms registered losses during the period 1992 to 1995. Since these farm types have no self-employed labour but only employees, they must pay in full for all labour costs. The same holds for land which has to be paid for, because these farms lease (almost) all the land they cultivate. Hence capital is the only fixed factor to which these losses can accrue.

The agricultural labour force in Germany declined by two thirds in less than two years after the beginning of the transition in 1990.<sup>26</sup> The number of job reductions in agriculture

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<sup>24</sup> Cf. appendix 6.

<sup>25</sup> Cf. appendix 4.

<sup>26</sup> During the GDR period not all persons employed by agriculture could, strictly speaking, be counted as agricultural workers. Many of them (estimates range from 15% to 20%) were engaged in non-agricultural activities such as construction work or providing social services, etc. Hence some decline

is extreme.<sup>27</sup> Of those 660.000 persons who had to leave agriculture by mid-1992, 28% retired, about 22% found employment elsewhere, 4% migrated to West Germany, 7% received training for a new occupation and 18% were employed in jobs which were partly or fully subsidised by the public. The remaining 21% became unemployed (SCHMITT 1993).

Size as well as the organisational forms of farms is still in a period of adjustment after 9 years. Individual private farms and partnerships are increasing in number as well as in the total area they cultivate. While successors of former socialist farms use decreasing amounts of land, their number has remained constant. This points toward a decline in their average size and it is indicative of an ongoing restructuring process, since the optimal size seems not to have been reached in the case of many of these farms (FROHBERG 1997). It will be interesting to see how many of the agricultural enterprises will eventually become family farms. Currently slightly more than 50% of the land is cultivated by successor farms, but with a declining trend. However, since the sale of state-owned land favours the latter type, family farms face greater difficulties in the future in gaining considerable portions of the land (BML 1995). However, the high transaction costs of large-scale farms work in favour of further reductions in size.

### 3.4 Labour in agriculture

As in all other industrialised countries, the number of employees in German agriculture has been decreasing for a long time. In 1998 1,35 million people were in full- or part-time employment in agriculture. This represents a decrease of 3,9% compared to the previous year. There are considerable structural differences between eastern and western Germany. In the western part mainly family labour is employed in agriculture and this is then usually on a part-time basis. In the eastern part, however, mainly hired labour is employed.

In terms of labour use East German agriculture can be compared to South African commercial agriculture like it is described in chapter 2.9.1. Production systems are much more standardised in East Germany and the number of farms are relative slight in comparison to the West. Moreover East German farms usually do not have a family labour

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in the number of 'agricultural' employment is due to the application of different criteria after transition.

<sup>27</sup> Cf. appendix 5.

farce with low opportunity costs of work, they are often run by professional management. Therefore it becomes more favourable in East Germany to use hired labour rather than family labour like it is common in West Germany. Tendentiously, the more the degree of commercialisation in agriculture the favourable is the use of hired labour. The same development can be noticed in American agriculture (BONNEN & SCHWEIKHARDT 1997). In 1997 approximately two thirds of all labourers were male - the female labourers were mainly part-time employees. Their contribution towards total work performed is approximately 27%. The share of female labour is especially high in the part-time farming enterprises of West Germany.

In West Germany around 1,2 million labourers were employed in agricultural enterprises in 1998. Compared to the previous year, this is an insignificant decrease of 4,4%. As a result of technological advances and the ongoing structural changes, the number of labourers per 100 ha land area has decreased from 6,0 labourers in 1991 to 4,6 labourers in 1998.

In the eastern part the decrease in the number of labourers was mainly influenced by the general transition taking place in agriculture and not so much by the "normal" structural changes. The number of family labourers increased by 1,5% to 48.500 between 1993 and 1995. The number of permanent, non-family employees has decreased by 2,4%, however. This caused the share of family labourers to increase from 9% in 1991 to more than 30% today.

Further considerable differences between the western and eastern part can be seen when labourers are differentiated according to the size of agricultural enterprises. Thus, for example, in 1995 only 3,9% of employees in the west worked in enterprises with more than 100 ha of land, whereas 67,2% of all labourers in the eastern part of Germany are employed on farms of that size.

### **3.5 Subsidies and direct income payments**

Agriculture faces great difficulties in adapting because of continuous excess production in important agricultural products and the related measures to restore market equilibrium. In order to cushion the process of adjustment, to improve the structure in rural areas and to preserve the cultural landscape, EU and government assistance to agriculture in the form of equalisation payments, subsidies and grants as well as direct transfers of income to individuals were clearly increased in the eighties.

In addition to this, a new agricultural market policy was introduced concerning certain plant and animal products as a result of the 1992 agricultural reform of the EC. Approximately 14,9 billion DM in the form of public aid was made available by the federal as well as regional governments. Germany's agricultural sector also received financial aid of 13,3 billion DM from the EU.

The equalisation payments to enterprises represent a significant part of the income of agricultural enterprises. The product-related price equalisation payments are payments made in the course of the EU agriculture reforms for wheat, maize, legumes, oil seeds and cattle. Enterprise-related payments are bound to the enterprise as a whole as well as its factor endowments. Equalisation payments for disadvantaged areas also fit into this category. They contribute towards the stabilisation of the income situation of smaller and middle-sized enterprises.

The enterprise-related equalisation payments amounted to 28.678 DM per enterprise in full-time farming in 1996. This represents an increase of 10% compared to the previous year. The increase can be traced back to the higher product-related equalisation payments, which amounted to 53% of total subsidies. The cash-crop enterprises with an average subsidy of 51.746 DM per enterprise lie above livestock farming and mixed farming enterprises, which receive approximately 27.000 DM per enterprise. The total amount of enterprise-related payments increases as the size of the enterprise increases. However, it decreases per ha. In part-time farming the enterprise-related payments amounted to an average of 13.938 DM per farm, but the amount per ha (694 DM) was clearly higher than that of the average for full-time farming enterprises.

### **3.6 The social position of agriculture**

A comparison of income is necessary in order to evaluate the social status of persons involved in agriculture. The functional comparison of income provides information about the profitability of agricultural production compared to the non-agricultural sector. The focus has to be on the compensation for the production factors land, labour and capital. Comparing personal income should provide information concerning the welfare of farmers' families compared to those of other sectors of the population.

Despite an increase in commercial and industrial income, the income gap between the agricultural and non-agricultural sector has increased slightly. Approximately 15% of full-time farming enterprises attained factor remuneration that is comparable to that of trade

and industry. These enterprises are successful because of larger production capacity, favorable locations, higher net investments, higher capital and greater efficiency. Less successful enterprises are mainly smaller full-time farming enterprises.

In the comparison of personal income, the total income of the management couple is considered. In 1996 this amounted to an average of 63.472 DM. Eighty-five percent of the total income was derived from agriculture. The disposable income was 47.947 DM per proprietors (e.g. husband and wife). A comparison of enterprise size reveals that only the larger full-time farming enterprises earn more disposable income than an average part-time farming enterprise. In small and middle-sized enterprises the disposable income just covered the requirements for livelihood and there are thus no financial means for investments in order to expand.

The total income of part-time farming enterprises in 1996 (68.210 DM per proprietary couple) was 7,5% higher than the average of full-time farming enterprises. Agricultural income constitutes only a small part of this income. Two thirds of the income is derived from other sources of income.<sup>28</sup>

### 3.7 Summary and results

In Germany, 516.300 agricultural enterprises, mainly individual enterprises, use a total area of 17,4 million ha. The number of farms has steadily decreased over the past few years and their average size has increased simultaneously. The number of enterprises smaller than 50 ha is decreasing. Despite this, there is a large structural difference between Germany's eastern and western areas.

In East Germany the number of co-operatives has decreased while the number of corporate farms has simultaneously increased. This is mainly due to a change in the legal form from co-operative to corporate farming. Private agriculture has increased, both in numbers of farmers as well as in the area cultivated by such farms. Private partnerships in particular are growing more rapidly than any other farm type. They were also the most successful organisational form in terms of profitability, followed by the individual farms. Co-operatives and corporate farms generally show poor profitability.

The number of people employed in agriculture is rapidly decreasing. In eastern Germany the labour force was reduced by two thirds during the first two years of transition. In

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<sup>28</sup> Cf. appendix 7.



western Germany, mostly family labour was employed on a part-time basis and the figure was reduced by 4,4% in 1998.

Only 41% of all enterprises are full-time farming operations, and of these only 10% could make a satisfactory profit. On the other hand, part-time farming enterprises could increase their profit even though they are concentrated in agriculturally disadvantaged areas. The majority of full-time farming enterprises have a disposable income lower than that of part-time farming enterprises.

The income of farmers consists largely of subsidies or direct transfers of income. The part-time farming enterprises and commercial large-scale cropping enterprises profit overproportionately from subsidies. The average net subsidy amount per hectare is clearly higher for part-time farming enterprises than it is for full-time farming enterprises. Despite increasing income the gap in terms of payments on production factors has increased between the agricultural and non-agricultural sector. On average part-time farming enterprises are more successful than full-time farming ones. Family farming agriculture dominates, with some exceptions in East Germany, the other forms of agriculture.

In the following chapter, some reasons for this dominance of family farming enterprises will be given with reference to the German agricultural structure.

## **CHAPTER FOUR**

# **THE DOMINANCE OF THE FAMILY FARM SYSTEM IN GERMAN AGRICULTURE**

### **4.1 Introduction**

Many agricultural economists have attempted to deal with the problem of the organisational forms in agriculture. Amongst them KARL MARX saw no future for small family farms because of the superiority of large enterprises as far as efficiency of production was concerned. Europe's present-day agricultural structure proves that this was a grossly mistaken conception. The question is thus what enabled the family farms to dominate so persistently in agriculture.

Because of the differences in the structure of the enterprises in West and East Germany and the changes they have undergone during the past five years, German agriculture is a suitable example for analysing the organisational forms in agriculture. Before and especially during the process of Germany's reunification, many national agricultural economists drew attention to the structural "deficiencies" of West German agriculture. Family enterprises in particular were considered not to have a promising future. The German agricultural report (BML 1999) shows that, although the number of enterprises in West Germany has declined, there has to date not been any large-scale dying-off of farms. What is not addressed in the report, however, is the question as to why the family enterprises have managed to remain competitive, especially in the face of direct competition from larger-scale agriculture in East Germany.

This chapter attempts to describe the advantages of the family farming economy in agriculture. The focus will be on household production as well as its primary and secondary effects. An impression of the size and the structure of farming families and households compared to comparable non-agricultural institutions as well as their changes over time will be shown. Two types of family farming enterprises – full-time and part-time farming – will be analysed further in terms of competitiveness and compared to each other as well as with co-operatives and socialist centrally planned agriculture. In closing, the

agricultural structure of East Germany will be considered in view of the changes in the organisational forms of agriculture since the reunification in 1990.

#### **4.2 Importance and characteristics of the family labour constitution**

In Germany the number of hired labourers in agriculture, especially that of the permanently employed, has decreased since 1950 to a greater extent than that of family labourers. The relationship between family and hired labourers stood at 5:1 after the war and has doubled to 11:1, but it has been stagnant since 1970. This shows that the family labour constitution has a dominant position which has been strengthened even further. In the past 20 years the number of hired labourers has increased again; in 1987 it amounted to approximately 15%. In the southern states of the EU, the share of hired labour was approximately 10%, while it lay between 10% and 20% in France, Denmark and the Netherlands. A relative increase in the employment of hired labour has been noticeable since 1980. However, a comparison of the relation of family and hired labour reveals that the family farming constitution dominates in all EU states except England<sup>29</sup>. SCHMITT (1989) speculates that the increase in hired labour that has recently been taking place can be attributed to the implementation of land- and capital-saving technical progress. A reduction in the working capacity of the farming family and a substitution of family labour by hired labour is also possible. In enterprises of up to 50 ha, the wage bill of hired labour remained constant, whereas that of family labour decreased. However, in enterprises over 50 ha the work expenditure of hired labour decreased while family labour time increased (STATISTICAL YEARBOOK 1988). This substitution of hired labour time by family labour time probably came about due to an increase of enterprise activities in favour of household activities. In the case of family enterprises smaller than 50 ha, family labour has presumably opted increasingly for off-farm employment. The overall trend has been to reduce the amount of labour in household production in favour of employment either within the enterprise or outside agriculture. The reasons for the latest developments in the allocation of labour in agriculture show that future developments in the size and structure of farming families and households as well as their changes over time must be taken into consideration.

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Because of the way Property Law and the Law of Succession are structured in England, the family farming constitution is treated as an exception. This can be traced back to the enclosure movement of the 17th century, which led to a high concentration of enterprises.

The labour capacity of the farm households is determined by the number of persons per household who are fit for work, the amount of time each person fit for work spends working as well as the productivity of this time worked. The number of household members who are fit to work and their time spent working decreases steadily with the general trend to shorten the time worked. It may be assumed, however, that the extent of time worked on-farm increases. Labour-saving advances in production as well as organisation lead to an increase in the capacity of family labour.

POLLAK (1985) refers to the importance of precise differentiation between family and household. In a developed economy these concepts are usually overlapping. In developing countries, however, a household is usually comprised of more people than only the nuclear family members. In German agriculture family labourers are defined so as to include the proprietor of the enterprise and his family members and relatives living on the farm. Hired labourers are all relatives not living on the farm as well as all non-family labourers.

The differences between agricultural and non-agricultural households are significant. In 1987 the average family size of 2,9 people in agriculture lay far above the national average of 2,13. This can be attributed to the fact that the agricultural household has more children under 18 years of age. The average size of a household in agriculture was 3,98, whereas all private households consisted of only 2,29 persons. A large part of agricultural households consisted of 5-6 persons, where the majority represented different generations. The difference between household and family size was 1,08 for agricultural households compared to 0,28 persons in all other households.

Households in part-time farming are smaller than full-time farming enterprises. The average household size decreased from 4,75 to 4,15 persons from 1960 to 1985. The household size of part-time farming enterprises is slightly smaller than that of full-time farming enterprises, which is indicative of a process of adjustment. On the whole, the number of household members is declining, in particular the number of members under 18 years of age, while the number of non-working persons is increasing. Agricultural households are developing so as to consist of fewer generations and to have a growing number of members employed off-farm. The increasing importance of off-farm employment as opposed to on-farm employment can be traced back to a change in family structure.

The share of family members in off-farm employment has also increased in full-time farming enterprises, although at the same time the share of assistant family members has

decreased. Once family members are employed off-farm, they do not leave those jobs, even if the labour requirements of the enterprise change to such an extent that the additional employment of hired labourers becomes necessary. The small increase of off-farm employment of household members of full-time farming enterprises does not point to a further expansion of off-farm employment, although an adjustment of this kind can be expected to occur when a transition from full-time to part-time farming enterprise occurs.<sup>30</sup> This also means, however, that the capacity for work of the enterprise can only be covered by labour-saving technological advances or, in the case of fast-growing enterprises, by hired labour (SCHMITT 1989).

### **4.3 The dominance of the family labour constitution**

The household serves the function of institutions which co-ordinate the economic activities of their members within and outside the household. Thus these 'household production factors' always compete for alternative utilisation outside the household. They can therefore be seen as representing the opportunity costs of the production factors utilised for production within the household. Efficient household production implies that the creation of value is at least equal to the opportunity costs of the factors employed.

#### **4.3.1 Family and household**

So far efficient household production only implies that it is economically advantageous to produce goods and services within the household rather than acquire them on the markets. It is important to note, however, that these advantages of efficiency depend on the size of the enterprise. Families and households almost always consist of several members. Thus the central issue is whether the economic reasons of the establishment for families and households as an institution (consisting of several persons) facilitate more efficient household production than other organisational forms. SCHMITT (1989) considers advantages in transaction costs to be the most important reason for the existence and the persistence of households with several members. According to POLLAK (1985), these are also more important than the cost advantages that result from the common management of a household. The cost advantages per produced unit of goods and services are, however,

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<sup>30</sup> Only in exceptional cases, such as a take-over of the farm by the son, will off-farm employment be given up in favour of on-farm employment.

nothing more than scale effects that are high at first, but decrease along with the increasing size of a household.

In economically well-developed countries household production is of little importance, since many goods and services can be obtained, ready for consumption, on the markets. In less developed countries and in the agriculture of many states, household production is important particularly what services are concerned. At this point attention will be paid to the “insurance” function of the services of the household mentioned by BECKER (1981). The household offers its members a certain degree of protection from illness, disability and unemployment, and it renders the services of insurance, education and training at a low price. This redistribution of income works better the larger the household. This is, incidentally, a reason why families in developing countries have so many children.

On the other hand, transaction costs increase along with family size. The efficient allocation of resources within family and household requires correspondingly exact information concerning the performance capacity of every individual in order to create efficient systems of incentive, remuneration and control so that deception, fraud and disloyalty can be prevented. To a certain extent the cost advantages of household production are compensated by the transaction costs. The optimal size of a household in terms of the balance between scale effects and transaction costs depends on the respective economic and social state of development of a country.

In the course of economic and social development, the optimal size of a household decreases. The relative advantages of the cost of household production decrease, since many services are obtainable cheaply on the market because of technical advances (HUFFMAN 1976b).

Secondly, the opportunity costs of members increase, which renders co-ordination within the family and the household more expensive. To an increasing extent training and social security are taken over by the state or by the market. This favours decreasing numbers per family and per household. This development could be observed in Germany’s agriculture during the past three decades.

#### **4.3.2 Family farming economy**

The employment of hired labour involves considerable transaction costs which increase rapidly with a growing use of hired labour. This can be traced back to difficulties in maintaining an adequately performing system of incentives and remuneration. The

measurement of performance rendered usually involves high costs. In economic theory this is known as the principle-agent problem. In agriculture technical production severely restricts efficient monitoring and supervising of hired labour. For POLLAK (1985) the principle-agent problem is the central argument for the organisational form of agriculture: *“When agricultural tasks can be monitored easily in terms of inputs or outputs, family farms are often overshadowed by other forms of agricultural organisation. ... nevertheless, since most farm tasks are not susceptible to either of these forms of supervision or monitoring, the family farm is the dominant form of agricultural organisation.”* From this, it can be deduced that hired labour does not represent a perfect substitute for family labour and that the family labour constitution is superior to the wage labour constitution in many parts of agriculture. SCHMITT (1989) also considers co-operative organisational forms inferior to the family labour constitution because of the transaction costs.

Secondly, in the course of a change of generations, the technical knowledge and expertise that were accumulated through experience are transferred more easily and cost effectively from one family member to the next in a family farming economy than can be achieved in other organisational forms. The family labourers are familiar with the circumstances of the agricultural enterprise so that training costs are extremely low.

Thirdly, interpersonal relations between family members and the commitments and ties that result from them lead to a personal and greater effort for household and enterprise. This refers to the well-known phenomenon of “common interest”. Loyalty and altruism lead to efficient co-ordination of agricultural activities within the framework of a family farming economy. The superiority of the quality of labour, the labour reserves and the adaptability to the workload is largely due to the correspondence of the family’s own interests and those of the enterprise. This simplifies the organisation of the enterprise; special incentives to improve performance are unnecessary since the family members have a natural interest in the enterprise. POLLAK (1985) sees a reason for “incentive advantages” of family governance because family members have claims on family resources. They are willing and cheap labourers, who are prepared to accept over-time or short time when these are required. It may be assumed that a significant part of these sociological aspects of the family labour constitution can be translated into advantages of transaction costs. Loyalty and altruism can, however, not be seen as the essential reason for the fact that family farming is advantageous (SCHMITT 1992b).

If there is inadequate co-ordination of resources in a family farming economy, this loss of efficiency cannot be compensated for by sociological transaction costs. The family labour

constitution may be superior to the wage labour constitution, but this cannot be accepted in general. The argument on the dominance and persistence of family enterprises raises the issue of the optimal size of an enterprise.

### **4.3.3 Optimal enterprise size**

In terms of household economics the maximum income from the enterprise that is achieved with minimal average cost does not necessarily represent the optimal size of the enterprise. Like it is described in the household economic analysis in chapter two, optimal farm size of an agricultural enterprise is arrived at when the farm income contributes optimally towards the total income of the household. This is the case when all members of the proprietor's family manage to produce a marginal value product that is equal to the off-farm wage rate.

The family labour capacity of the farming household represents the maximum supply of labour that the enterprise has at its disposal. At a given wage rate the demand for labour is derived from the optimal farm size of the enterprise. According to the definition, this size is the size permitted by the opportunity costs of work with a wage rate that covers the marginal use of labour in agriculture. If the demand for labour that is derived from the income capacity of the enterprise surpasses the working capacity of that farming household, it makes sense to employ additional labourers. An expansion of the enterprise and the employment of hired labourers in addition to the family labourers often seems inefficient, however, since the realisable increase in profit is not sufficient to remunerate the hired labourers. From this point of view it becomes evident that the cost-reducing scale effects brought about by expansion of an enterprise are insignificant. This adds a new perspective to the problem of the optimal size of the enterprise in agriculture as well as a different explanation of what used to be the norm in agricultural economics up to now.

The relevance of the above definition of the optimal farm size can be supported from a statistical point of view. SCHMITT (1992a) records a decreasing share of income in agriculture, dependent on household size. The importance of the non-agricultural income of family enterprises increases along with the household's size. This means that the optimal farm size must increasingly adjust itself according to off-farm time allocation of the farm household. Thus as an outcome of this argument, the purely business and micro-economic aspects of the optimal farm size are less important for family farming enterprises.



#### **4.3.4 Coherence of hired labourers, farm size and land**

On average less than 1 hired labourer and less than 2,25 labourers in total were employed in full-time farming enterprises. The share of farms employing less than two labourers increased, while in the group of enterprises employing wage labourers only the farms employing less than 1 hired labourer increased (BML 1997). These data alone are, however, insufficient to confirm an increase in importance of hired labour in West German agriculture. They simply mean that the share of family farming enterprises employing up to two labourers has increased.

Along with an increasing number of labourers, the relationship between a farmer's own and rented land has shifted. The effect of the increased structural change was that the share of a farmer's cultivated personally owned land decreased from 63% to 50% between 1980 and 1990. For the average full-time farming enterprise the arable area has increased by 38%. Rented land area has increased by 98% and personally owned land by only 8%. In enterprises with more than 4 wage labourers, the rented land area has only increased by 39% and personally owned land decreased by 40% (BML 1997).<sup>31</sup> Growth in these enterprises usually takes place by means of renting additional land. The most successful enterprises were those employing between one and two labourers - they experienced growth of 128%. The number of hired labourers increased along with increasing size of the enterprise. However, there were still considerably fewer hired labourers than family labourers.

It can thus be concluded that, with a ratio of approximately 1,5 wage labourers to 2 family labourers, the transaction costs of employment are still low. Otherwise this group of farms would not grow so successfully. A larger number of wage labourers hinders enterprise growth as can be seen in enterprises with more than 4 wage labourers.

The income per full-time farming enterprise increased from 1980 to 1990 by 54% and by 36% per family labourer. The enterprises with a labour force of up to 2,3 recorded below average growth. In the larger full-time farming enterprises, the increase in income was below average. According to SCHMITT (1996d), this is because of disproportionately growing transaction costs with an increasing number of labourers. He analyses larger enterprises with more than 3 labourers in comparison with farms employing more than 3

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<sup>31</sup> A possible explanation why land area did not increase in proportion with labourers is that these enterprises increasingly kept livestock, which is more labour-intensive. However, this is not the case.

hired labourers and reaches the conclusion that, between 1980 and 1994, the largest enterprises employing wage labour lost competitiveness drastically compared to family farming enterprises. This reconfirms the superiority of the family farming constitution over the wage labour constitution.

A concentration of enterprises has recently occurred. It mainly took place by way of the renting of additional land. In this process family farm enterprises proved to be the most successful. Technical progress and economies of scale constantly helped to increase the family's capacity to work. Even if the enterprises were enlarged, hired labourers were only employed to a limited extent. This is an indicator of the imperfect substitutability of family labourers.

#### **4.4 Part-time farming versus full-time farming**

The number of full-time farming enterprises in western Germany decreased from 418.000 to 280.000 between 1979 and 1991, thus by 23%. The number of part-time farming enterprises only decreased by 18%, i.e. from 424.000 to 325.000. In this period approximately 42% of part-time farming enterprises gave up agricultural production. At the same time, however, 93.000 enterprises switched from full-time farming to part-time farming, while about 33.000 new establishments were added as well. This is an indicator of the structural change in agriculture. The share of part-time farming enterprises in the total number of enterprises increased from 50% to 55% and their share of cultivated land also increased from 19% to 23%; the average enterprise size grew from 4,8 to 7,8 ha. The share of household income derived from agriculture, however, steadily decreased in part-time farming enterprises, although the difference between the income of part-time farming enterprises from agriculture and the income of full-time farming enterprises was reduced.

The strong increase in part-time agriculture, especially compared to that of smaller full-time farming enterprises, is remarkable. According to the German agricultural report (BML 1996), smaller full-time farmers are not able to compete effectively. With the transition from full-time to part-time agriculture, competitiveness can obviously be regained. If this were not the case, their share of the total number of enterprises would not

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Farms with less than 2 labourers kept 93 LSU per 100 ha, as compared to farms of up to 2 labourers, which kept 160 LSU.

increase (SCHMITT 1996c). An explanation is still lacking for the phenomenon that the transition from full-time farming to part-time farming leads to a lowering of cost, which is sufficient to restore the competitiveness of an enterprise.

The definition of a full-time farming enterprise is that it is a farm in which work related to the enterprise is performed mainly by family members who do not have off-farm employment. The on-farm working time takes up at least 50% of the household's working capacity and the income from off-farm employment contributes 10% at the most to total income. In a part-time farming enterprise the conditions are totally different. There the off-farm working time is at least 50%, and hence off-farm employment is more important (BML 1997). In general, this income exceeds the farming income. This, however, does not always have to be the case. SCHMITT (1996c) defines a part-time farming enterprise as one whose off-farm income exceeds that from farming.

Further differences between part-time and full-time farming enterprises lie in the allocation of labour:

- (1) It is usually the owner of a part-time farming enterprise who is employed off-farm, while in full-time enterprises family members of the proprietor are usually employed off-farm. The farming work of part-time enterprises is done in part - up to 40% - by the spouse or another family member of the proprietor.
- (2) Part-time and full-time farming enterprises react in different ways to an increasing wage level as well as the related increase of opportunity costs of the work. The household theory dealt with in chapter two implies that farmers on full-time farming enterprises must expand their enterprise so that the on-farm allocation of labour time remains favorable. Alternatively, they have to change over into part-time farming and adjust the size of the enterprise according to the reduced working capacity that is brought about by off-farm employment.
- (3) The education of proprietors of part-time farming enterprises is remarkably better than that of full-time farming enterprises. The share of part-time farmers with A-levels is much higher than among full-time farmers. This implies that off-farm employment probably has higher skilled requirements. Full-time farmers have a much better agricultural education, however, while part-time farmers are usually qualified professionals in fields other than agriculture. The employment status of these part-time farmers has thus changed during the

past few years. The share of unskilled labourers has been reduced by half, while the share of skilled labourers has more than doubled.<sup>32</sup>

According to SCHMITT (1996b and 1996c), the calculation of opportunity costs by means of industrial wages - as is done in the annual German agricultural report - is incorrect, since the opportunity costs of full-time and part-time farmers, as well as those of young and old people, are different. This is not taken into consideration by the report. SCHMITT (1996c) works with the assumption that the opportunity costs of part-time farmers correspond with non-agricultural wages. The same off-farm income could be earned by younger family members of full-time farming enterprises if they were employed off-farm.<sup>33</sup> Because of their professional qualifications part-time farmers earn relatively high off-farm wages which compare favourably with the income of full-time farming enterprises. Full-time farming enterprises, however, achieve equal or higher agricultural wages if labour is used efficiently. This means that the opportunity costs of on-farm work are systematically lower in part-time farming enterprises than in full-time farming. A possible explanation for the comparatively high opportunity costs in full-time farming enterprises is that a part of this on-farm work is performed by younger proprietors, who could earn an off-farm income that is as high as that earned by part-time farmers.

Furthermore, the share of agricultural work performed in part-time farming by family members who have opportunity costs of almost zero is much higher. Thus, costs of performing work in part-time farming enterprises are considerably lower than in full-time farming enterprises. This implies an increasing competitiveness and it also explains the factually supported increase in part-time farming recorded in the annual German agricultural report (BML 1996). When full-time farming enterprises change over to become part-time farming enterprises, the general costs of performing work are lowered, thereby restoring the competitiveness of the enterprise.

A further indicator of the competitiveness of part-time farming enterprises can be noticed on the land rent market. On average part-time farming enterprises use 46% of their income for additional land rent, while full-time farmers only spend 26% on this. Part-time farming enterprises cultivate rented land and expand these areas absolutely and relatively. The

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<sup>32</sup> This fact draws attention to the relevance of opportunity costs concerning the compensation for production factors in part-time agriculture. With increasing non-agricultural qualifications and status of employment, the opportunity costs of the work performed also increases.

<sup>33</sup> In this context, managers/proprietors up to 45 years of age are considered to be young, since it is easier for them than for older farmers to find employment outside the enterprise. This implies a decrease in opportunity costs from full-time farmers as age increases. In SCHMITT (1995) this distinction is made with respect to the size of the enterprise as well as income.

average rented area in the period from 1984 to 1994 increased from 3,17 ha to 6,26 ha. Part-time farmers considered the 48% increase in rent prices and the 93% increase in rent expenses to be economic and were thus able to compete with full-time farming enterprises (SCHMITT 1996e). This is confirmed by the economic success of these enterprises. In the period in question the income from agriculture was only 45% of that of full-time farmers, but the average disposable income of part-time farming enterprises was clearly higher. From this it can be concluded that a very efficient factor allocation occurs in part-time farming households and that these households have managed to adapt the organisation of their farming enterprises to the change in agricultural as well as general economic conditions.

#### **4.5 Family farms versus co-operatives and centrally planned agriculture**

Collectivisation in the former GDR<sup>34</sup> aimed at increasing productivity of resource use in agriculture provided by big farms utilising the most modern and efficient technological methods of production and realising large economies of scale. Another aim was to release capital and labour from agriculture in order to promote industrialisation.<sup>35</sup> The result of these policies is now evident in all the former socialist states. Social costs linked to the establishment of big farms replacing a great number of peasant farms have been rather high. Therefore the question arises whether collectivisation really increased the productivity of factor use in agriculture as compared to the efficiency of that used in family agriculture.

In centrally planned economies the transaction costs of private economies are transferred to the central planning authority. It has to be assumed theoretically that transaction costs at the farm level are zero, because all decisions and planning are already done efficiently by the central planning authority. The structure of collective farms is based more on technical than on economic efficiency. Optimal enterprise size is determined by technical equipment, i.e. machinery, in order to achieve the largest possible scale effects. As a consequence the farms were so large that economies played a subordinate role. Owing to

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<sup>34</sup> In the former GDR the restructuring of agriculture after 1945 began with the land reform. Initially the creation of agricultural co-operatives took place voluntarily, but after 1955 collectivisation became compulsory. The new large-scale enterprises were either state farms or co-operatives. In practice there was no difference between these forms of enterprises.

<sup>35</sup> During the 1920s in Russia the goal of political and economic control over small farmers was added to this.

the fact that neither collective nor state farm size has been determined by economic factors, these farms do not realise maximum efficiency in factor use.

The transaction costs of zero for an individual state farm are only realistic if the central planning authority meets its conditions of optimal resource use in terms of inputs and outputs exactly. From past mistakes, however, it has become evident that central planning and resource allocation by central planning authorities has failed to a large extent and that therefore the transaction costs at farm level were not zero. Discrepancies between planning data and resource allocation resulted in a tremendous misallocation of resources and further welfare losses. Individual farms are burdened by large transaction costs caused by necessary adjustments of the farm's resources, which can be seen from the oversized administrative apparatus of such farms.

In practice there must be large scale effects to make up for transaction costs. In assuming that rising transaction costs are linked especially to hired labour input and are not fully compensated by scale returns, it follows that family farm organisation is economically superior to centrally planned agriculture.

The question arises why in a market economy the economic superiority of family enterprises cannot be easily transferred to producer co-operatives in order to gain scale effects. A reason that is always given for the inadequate competitiveness of producer co-operatives is the decision-making structure. The main problem is related to the inefficiency of democratic decision-making processes concerning efficient allocation of resources and corresponding distribution of income achieved between each member of such producer co-operatives competing with individual farms.

Secondly, the principle-agent problem of establishing a compensation system for members cannot be solved as efficiently as in family farms. The private interests of a member do not always correspond with the interests of the co-operative that determines certain regulations for production. This implies that the farmer or employee can no longer act at his own discretion, which is the only way to perform efficiently. Bureaucratic regulations will lead to a loss of work motivation, which eventually leads to a sharp decline in farm productivity.

The specific difficulties and implications of rational decision-making by the central headquarters of big co-operative farms are reflected in higher transaction costs and hence

in relatively poor performance. The competitiveness of such farms is relatively weak.<sup>36</sup> Therefore, agricultural production in Western countries is dominated by family farms and the dominance of these family farms can mainly be explained by lower transaction costs. Recently co-operatives have been experiencing problems concerning competition, which does not have an insignificant bearing on higher transaction costs. As a rule individual enterprises and family farms are more efficient than co-operatives. Collective agriculture cannot be described as efficient. It requires extremely high information costs in order to allocate resources. The efficiency of the market mechanism that is responsible for this allocation in market economies cannot be attained in this way. Positive scale effects are made up for by high transaction costs and welfare losses, which are due to a misallocation of resources. Centrally planned agriculture has a high degree of economic inefficiency.

#### **4.6 Development of the East German agricultural structure**

The first successes of the transformation of East German agriculture since reunification are now clearly visible. Labour and capital productivity of some farms is already higher than in West Germany. However, the price for this success has been a rapid transfer of capital and know-how, while 80% of the work force of the former GDR agriculture has been forced to leave the sector. This was made easier with accompanying social security measures (GFA 1995). Private enterprises have increased in importance. They represent 80% of all agricultural enterprises, although they only cultivate 20% of arable land. The number of partnerships has more than doubled – up to 2.820 since 1991.

Compared to other legal forms, the number of corporate bodies has not undergone much change from 1991 to 1998 (BML 1999). The average farm size differs considerably among the different legal forms. Private partnerships, with 440 ha, are approximately half the size of corporate bodies and ten times the size of an individual farm (FROHBERG 1997).<sup>37</sup> Twenty-eight percent of all individual farms are full-time and approximately 70% are part-time farming enterprises. The size of the full-time as well as the part-time farming enterprises, however, is much larger than in West Germany.

The profitability of different forms of enterprises cannot be compared easily because of different accountancy rules and taxation. But tendentially, partnerships and individual

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<sup>36</sup> Cf. appendix 4 and chapter 3.

<sup>37</sup> Cf. appendix 6.

family farms are much more profitable than corporate bodies.<sup>38</sup> Large-scale agricultural production in corporate bodies and co-operatives is still hardly profitable at all (BML 1999).

Untransformed successors of former GDR state farms do not have much chance of survival in the free market economy. Many enterprises were divided up into smaller units and privatised or kept running as corporate bodies. These enterprises are not very profitable and they are also experiencing grave economic problems.

It is clear that transaction costs in agriculture play a significant role. In particular, they affect enterprises with a high level of wage labour or enterprises that are organised along the lines of a co-operative. The collapse of agricultural production and the following dramatic restructuring process in East German agriculture after 1990 shows impressively that a collective agriculture is not economically efficient and cannot prove itself to be viable in a market economy (FROHBERG 1997). The restructuring process is not yet completed, but it will not proceed as rapidly as it has in the past. A further increase in private and family enterprises as well as a reduction in the number of the less profitable corporate bodies can be expected in the future.

#### **4.7 Summary and results**

In the past few decades the amount of hired labour in German agriculture has decreased dramatically. Most recently a slight increase in wage the numbers of labourers has been registered. In smaller enterprises the family labour capacity is decreasing, while hired labour remains constant. In larger enterprises wage labour is substituted for family labour. In general there has been a limitation of household production in favour to off-farm employment. Part-time farming enterprises are especially affected by a decrease in the on-farm work capacity, since family members increasingly accept off-farm employment. Full-time farming enterprises are not affected by this to such a serious extent. However, this kind of adjustment is to be expected in the transition from full-time to part-time farming.

Within the household there has been a redistribution of income amongst the family members. This can be seen as an efficient social security system. As household size increases, the transaction costs of resource allocation increase. The optimal farm size

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<sup>38</sup> Cf. appendix 4.



depends on the respective economic and social state of development of a region. The optimal household size is given when the income from agriculture contributes optimally towards total income. The larger the household, the greater the importance of income from off-farm employment.

The family farming economy secures an efficient allocation of resources between farm production and off-farm employment. The principle-agent-problem explains the advantages of transaction costs of the family labour constitution compared to wage labour constitutions. Training within the family is effective and low-cost. Furthermore, family members have a common interest in the economic success of the enterprise. The superiority of the family labour constitution as far as the quality of labour, labour reserves as well as the adaptability to the quantity of labour required is concerned is mainly due to the overlapping of the family's own interests with the interest in the enterprise.

Growth of agricultural enterprises takes place by means of renting additional land area. The most successful enterprises were the small family farms. Large enterprises with many labourers displayed below-average growth. Full-time farming enterprises which lost their competitiveness regained it by changing to part-time farming. The opportunity costs of work in part-time farming is lower than that of full-time farming enterprises, since work allocation takes place in favour of the highest marginal yield. Thus wages in full-time farming enterprises are the same or higher than those of off-farm employment. Furthermore, on-farm work in part-time farming enterprises is to a large extent performed by family labourers with opportunity costs of almost zero.

If one compares private enterprises to co-operatives or centrally planned agriculture, a decrease in efficiency can be observed. Co-operatives have higher transaction costs because of inefficient decision-making processes and resource allocation. Conflicting interests between members and the co-operative lead to a decline in motivation and productivity. In centrally planned agriculture the allocation of production factors is done by a public central planning authority. Differences between planning and resource allocation result in misallocations which, in turn, result in losses of efficiency and welfare. High information and transaction costs are the causes of economic inefficiency of centrally planned agriculture. In a free market economy the large-scale agriculture of the former GDR has been split up into smaller private enterprises in which the share of family enterprises is gaining in importance.

**PART THREE**  
**SOUTH AFRICAN AGRICULTURE: THE**  
**HISTORICAL FRAMEWORK**

## CHAPTER FIVE

### THE DEVELOPMENT OF DUALISTIC AGRICULTURE IN SA

#### 5.1 Introduction

Between 1700 and 1910 an agricultural sector developed in South Africa that was characterised by family farming run by black as well as white farmers. Black agriculture existed partly on the basis of leasing or crop sharing. By the turn of the 19<sup>th</sup> century black farmers had introduced new techniques which made farming more efficient. They were able to compete successfully with white farmers.

After the discovery of diamond in Kimberley in the 1870s and the Witwatersrand gold rush of 1886 the demand for agricultural products increased and the agricultural sector gained in importance as a provider of food as well as a source of labour for the mining industry. After the formation of the Union of South Africa in 1910, white farmers were progressively favoured by the State, while Africans were disadvantaged and farming later became impossible for them. In the years following this white farming developed to become a large-scale production sector dependent on hired labour, while black farming regressed gradually to become a deficient subsistence enterprise.

In the previous chapter, the advantages of family farming and the ever-present dominance of the family farm in the agricultural sectors of industrialised countries was shown using German agriculture as an example. This chapter will investigate why South African agriculture developed in the opposite direction, although family farming was initially the dominant form of enterprise. Which factors contributed to the development of two very different agricultural sectors? Finally, the efficiency of commercial agricultural production will be investigated.

## 5.2 The commercial farming sector

The South African commercial agricultural sector is characterised by large-scale production. The horticulture sub-sector is particularly labour intensive, while cereal and stock farming are characterised as a large-scale, labour-extensive farm industry. In general commercial agriculture is highly capitalised and dependent on hired labour.

### 5.2.1 The labour factor

The demand for hired labour in South Africa is several times higher than in the family farming enterprises of industrialised countries. In the absence of an oversupply of labour, this should mean that wages are relatively high because of limited local availability, and that there is a drastic increase in wages during seasonal periods of high demand. However, this would also necessarily mean that the wage and transaction costs of large-scale agriculture are high, and competitiveness in relation to smaller family enterprises would no longer be a given. State and farmers together, however, ensured that the wage level remained low and that the influence and the rights of farm labourers decreased over time (MARCUS 1989). The South African Agricultural Union (SAAU) was a prime instrument in these efforts.

In order to keep wages low, agriculture and the mining sector were separated from the rest of the labour market by restricting migration of potential labourers out of the rural areas.<sup>39</sup> Influx control to urban environments and work reservation regulations led to limited urban job opportunities for the rural black community, which provided the majority of agricultural labourers. This prevented the uncontrolled migration of labourers (MARCUS 1989). Wages were not determined on the basis of productivity or according to market forces, but were geared to the minimum subsistence requirements of the African population. For some time wages in agriculture amounted to less than one tenth of those in the mining sector. VAN SCHALKWYK & GROENEWALD (1992) estimated that wages have been generally below the marginal productivity of labour.

The second mechanism to keep agricultural wages low was prison labour. It was systematically used by the state and played an important role in agriculture.

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<sup>39</sup> The most important legislative changes were the Natives' Land Act of 1913 that segregated Africans and Europeans on a territorial basis, restricting Africans to native reserves. Subsequent legislation

Approximately 13% of all farmers used to employ prison labour. According to conservative estimates the number of prisoners working on farms at any given time was 100.000, which was close to 10% of the total labour force in commercial agriculture (MARCUS 1989). Forced labour stood in direct competition to “normal” labour and this had an influence on wages in agriculture. The prison labour system played a particularly important role in the drive to restructure the composition of farm labour in South Africa. In the horticultural sector, amongst others, labourers were sent as contract workers to commercial farms via so-called recruiting organisations or recruiting co-operatives. The wages differed according to different sectors and regions, but they were generally very low. Agricultural labourers’ unions were disorganised and powerless against the mighty interest groups of farmers (MARCUS 1989).<sup>40</sup>

An important indirect influence on rural wages, particularly for unskilled labour, was the low cost of capital which was used to substitute labour. The result was an extremely rapid concentration and centralisation of land, capital and innovation in agriculture. This led to extensive substitution of labour by capital and to a differentiation of the labour force. SIMKINS (1987) estimated that the non-homeland rural areas lost some one million people between 1980 and 1985. Given the natural rate of population growth, this means that some 1,6 million people moved off the white farms during this period. The same effect could also be observed in Zimbabwe. Increased implementation of capital in the plantation industry left over 100.000 farm labourers between 1974 and 1984 unemployed (LOEWENSON 1992).

Thus credit subsidies and labour legislation lead to a reduction of the costs of labour and to the rapid growth of the size of enterprises in the South African commercial agricultural sector. The household theory dealt with in chapter two, as described by SCHMITT (1995), implies that the household will allocate its labour resources towards the highest-paid opportunity and consequently take part in the off-farm labour market. The commercial farms used the advantages of the labour market and substituted family labour for low cost hired labour. Therefore farms were able to grow irrespective of their household labour resources and could allocate family labour towards highest returns.

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restricted the ability of farm workers to change employment and prevented African farmers from joining marketing co-operatives and farmers’ unions.

<sup>40</sup> African labour unions were only legally recognised in 1979.

Increased transaction costs do not seem to have affected commercial agriculture significantly, or were at least not noticeable to the individual farmer. It could even be said that the extremely low wages facilitated the transformation of family-based agriculture into large-scale agriculture.

### 5.2.2 The capital factor

Since the seventies the real debt burden in commercial agriculture increased dramatically, while there was a simultaneous decrease in the value of farms and in income. From 1975 to 1987 the loan capital ratio (total debt/value of capital assets) rose from 11,8% to 26%. After the agricultural sector shrank to become slightly healthier, the debt rate at the beginning of the nineties was only 23%.<sup>41</sup>

At the beginning of the seventies the Land Bank began subsidising long-term credits in agriculture. Before 1970 effective<sup>42</sup> interest was between 1% and 4%. Real interest rates fell from -0,4% in 1971 to -6,5% in 1975, then fluctuated between -4% and -4,2% from 1976 to 1978 before dropping to a low of -8,2% in 1981. After that the interest level in agriculture remained positive (WORLD BANK 1994). Because of the availability of capital, many farmers were able to expand their operations quite substantially. The cost of mechanisation was further reduced by possibilities of special tax write-offs (SPIES 1996). From 1983 onwards the massive subsidies in the commercial sector were reduced, which led to increased and positive real interest rates for farmers. The financial management in agriculture could not adapt very easily to the changed framework conditions, which meant that the debt rate of farmers increased at an alarming pace in some sub-sectors (VINK 1993).

Insolvent or near-insolvent farmers were supplied with especially favourable loans by the Agriculture Credit Board (ACB). The interest rate was set at approximately half to a third of the normal commercial interest rate.<sup>43</sup> Although 64% of the farmers who were served by the ACB had fallen into arrears by 1993, the number of sequestrations has remained relatively constant over time. State intervention on the capital market and the subsidising

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<sup>41</sup> Cf. appendix 2.

<sup>42</sup> Interest rate refers to real interest or nominal interest rate minus the inflation rate.

<sup>43</sup> The nominal interest rate of the ACB's long term credits was 8% for farmers who are qualified for the scheme, while the Land Bank offered 16%. Short-term credits for crop production were also offered at 8%, while commercial credits cost 21%.

of particularly poor farmers prevented a general transformation and a drastic price decrease for land. This would have had catastrophic consequences for the entire sector.

The STRAUSS COMMISSION (1996) mentioned that the ACB represented the major direct intervention by the state in the provision of subsidised agricultural finance to commercial farmers, especially those in financial crisis. It was generally accepted that, even with great economic losses, the minority of commercial farmers should be supported for policy reasons. In a financial environment marked by intervention, the farms developed into large-scale units. Because of transaction cost advantages in access to credit, large farms in particular could benefit from this policy (BINSWANGER et al. 1995).

### **5.2.3 Legislative and policy instruments**

In 1988 22.190 farmers (33% of the commercial farming population) owned more than 1.000 ha each, which together constitutes 84% of commercial land. They generated 50% of gross income and 64% of farm profits. This concentration was promoted by the Subdivision of Agricultural Land Act of 1970 and the Agricultural Credit Act of 1966. The former prohibited farms from being subdivided into smaller subdivisions without permission from the Minister of Agriculture. This prevented farms from being split up into smaller units in the case of sale or the bequeathing of a farm and thereby contributed indirectly to the concentration of landownership.

The Agricultural Credit Act also contained provisions for the consolidation of what are defined as non-viable small farming units into viable units. One viable unit was defined as a farm size which yields a full-time agricultural income comparable to urban income. The transition to small-scale, part-time farming was also hardly possible, while growth from part-time to full-time farming was actively promoted. The viability definition became a self-fulfilling prophecy, because under the Agricultural Credit Act all farms below the viable size were excluded from assistance (VAN ZYL 1995).

The controlled marketing environment was dominated by producer organisations. The co-operatives had a monopoly of power in many agricultural sub-sectors, which favoured the commercial producers. This was further supported by the fact that the co-operatives were represented by certain farmers in the South African Agricultural Union (SAAU). At the same time the SAAU advised the Minister of Agriculture on important agricultural marketing issues (LIPTON 1996). The producers played a major role in the institutions that controlled and implemented the various marketing schemes, while small-scale producers

had very limited power to intervene in the management of controlling institutions (FAO 1995).

The co-operative movement and the Marketing Boards in South African agriculture were marked by “collective action” to ensure state support of the commercial agricultural sector. VINK & KASSIER (1991) saw in the use of “collective action” a reason why a minority group of the population could have such effective political influence.

The security of markets and of prices promoted the growth of commercial farms, since prices and markets were never restrictive factors. The presence of the single-channel marketing system for many crops tended to promote concentration in the marketing and processing industry as well. The South African abattoir industry, for example, has been concentrated by the quota control system under the meat scheme. In the processing sector the single-channel marketing system led to a concentration on the demand and supply side through economies of scale. In the process the different marketing schemes had an active influence. Certain larger producers could, because of economies of scale, expand in an oligopolistic market. Especially in the poultry industry dominant producers developed extremely efficient, low-cost production systems in the course of the eighties (FAO 1995).

The complicated market regulations and the exclusion of South Africa from the world market forced producers to focus on the domestic market. Fixed prices and quotas made market entry and competition difficult, and a system of licences as well as a focus on production, processing and distribution was successful.

### **5.3 Household factors in subsistence production**

Now that the different reasons for the development of the commercial sector have been discussed in the preceding paragraphs of this chapter, the questions that arise are which factors influenced the development of the subsistence sector and what is the reason for its regression to an insignificant, deficit-producing sector.

The household factors are essential to understand agricultural production within the subsistence sector. They influence the quantity of production and therefore the possibility for each household to sell a surplus on the market to achieve producer rent as it is described in the LOW (1986) model of a subsistence household in chapter two. Only if producer rents are achieved will the subsistence household be able to gain positive scale effects that would enable a switch to small-scale commercial production. HERON (1991) identified such scale effects in a Transkei household study.



### 5.3.1 Migrant labour and rural production: A comparative advantage approach

Migrant labour remains an important factor in the South African economy. The greatest demand for migrant labour is traditionally within the mining sector (YUDELMANN 1983). In the subsistence farming areas migration income contribute significantly to household income. HERON (1991) found that in the Transkei between 40% and 73% of all adult males earned a migration income. In a typical Transkei household about 90% of the total income was generated by migrant work.<sup>44</sup> ECKERT & WILLIAMS (1995) determined a non-agricultural income of 94% for the Ciskei. This implies that the households depend on migrant labour to cover the cost of basic foodstuffs, and also that a large part of household members are not available for subsistence food production.

The preference of migrant labour for crop production is a function of the off-farm wages.<sup>45</sup> Between 1975 and 1985 the average monthly wages of a mineworker were approx. R200 (YUDELMANN 1983). LOW (1986) calculated an average yield of 2.600 kg maize for a four- to five-member Swazi family with access to 2 hectares of arable land. In 1977 this had a retail value of R343.<sup>46</sup> This is equivalent to a net production value of approx. R75 per household member in subsistence production, compared to R2.200<sup>47</sup> in off-farm wages.<sup>48</sup>

SCHEJTMAN (1992) explains the relative advantage of wage employment with a modification of the TSCHAJANOW model. He presumes that in a peasant economy, given the neo-classical curve of the production function, production generally occurs at or near the point of maximum intensity. This implies a marginal labour productivity [ $\delta Y/\delta L$ ] of zero or almost zero. On the off-farm labour market, however, the marginal productivity of labour is positive as a result of competition.

Migrant labour has a clear influence on agricultural production in subsistence production areas. The decade-long policy of migrant labour indirectly prevented the development of

<sup>44</sup> Cf. appendix 1.

<sup>45</sup> Cf. chapter 2, paragraph 2.8.

<sup>46</sup> Presupposing that one household member can earn migrant income of approximately R 2.200 and the remaining household generates a subsistence income of R 340, the contribution of subsistence income to the total household income is about 15% after subtracting the maintenance costs of the migrant worker. This figure corresponds roughly with the proportion established in the Transkei by HERON (1991).

<sup>47</sup> A contract period of 11 months is presumed.

<sup>48</sup> The value of subsistence production per household member only relates to the marketable field crops. In practice, however, it is very difficult to determine household production, which must also be taken into account.

agricultural production in the homelands. Therefore, subsistence production has even decreased over the years, while most farmers remain net deficit producers, which implies an increasing market for commercially produced South African food (MAKENETTE et al. 1997).

### 5.3.2 Life cycle and opportunity costs

The typical life cycle of a peasant household is described by TSCHAJANOW (1966) and BECKER (1981). The different phases have distinct consequences for the subsistence household as far as production economics is concerned. In the first phase the household consists of several members who are fit for work. However, the head of the household is at the best age for migrant labour. The opportunity costs of subsistence cropping are correspondingly high. The household theory dealt with in chapter two, as described by LOW (1986), implies that the household will allocate its labour resources towards the highest-paid opportunity. This *de facto* results in the phenomenon that the rural household is led by a woman who is prevented from engaging in extensive field labour by her household and child-rearing responsibilities. Labour-intensive farm technology is probably not appropriate in this setting (ECKERT & WILLIAMS 1995).

In the second and third phases of the life cycle subsistence production is limited by demographic factors. The number of household members fit for work has decreased, while the number of consumers increases. Total income and specifically subsistence production decreases.

Life cycle and opportunity costs of labour influence subsistence production. Although the largest number of labour resources is present in the household in the first phase of the life cycle, subsistence food production is not necessarily highest at that stage because of the high opportunity costs. However, total income is at its highest, since the household allocates its resources in such a way as to maximise utility as it is described in chapter 2.8 and 2.9.

### 5.3.3 Producer prices and surplus production

In section 5.3.1 the relationship between wage employment and subsistence production was explained. This is now expanded by the possibility of cash crop farming and its influencing factors. Cash crop farming will only be an efficient source of income for the

household if the net revenue is equal to the employment wage. The household theory dealt with in chapter two, as described by LOW (1986), implies that it therefore depends heavily on the opportunity cost of labour in cash crop production and the crop value at the farm gate. Under the assumption that the household allocates labour with low opportunity costs to crop production and an optimal return to labour is reached, it depends only on the crops' farm gate price whether the household produces for its own consumption or for the market.<sup>49</sup> Under fixed opportunity costs of labour, the price level is the crucial factor. If the net profit of production surpasses the income from wage employment, labour with higher opportunity costs can be taken away from wage-employment and allocated to cash crop production.<sup>50</sup> The crop price decides under *ceteris paribus* assumptions whether a household is a deficit or a surplus food producer.

The producer price for food is, besides the off-farm wage, a factor which has a significant influence on the development of a subsistence economy into a more commercially orientated economy. In South Africa wages in the mining sector were relatively high in earlier decades, and food prices quite low in comparison. In many subsistence households there is a lack of enthusiasm to produce cash crops, since the additional benefit is very small. Low producer prices for food together with high off-farm wages tend to reduce subsistence farming activities to a minimum.

#### 5.4 Productivity in South African agriculture

Differences in productivity between small and large farms are difficult to measure. Land area is a cause of measurement problems because agro-climatic potential and land quality differ from region to region. The only sensible way to measure productivity is in terms of invested capital rather than per area unit.

In theory, and presupposing the existence of perfect markets, there is no difference in productivity between large and small farms. GOSSEN (1851-1926) formulated this relation as follows in his third law: "The input factors are applied to different purposes in such a way that the marginal utility is the same for all purposes". The market mechanism leads to a production structure in which the factor productivity is the same for large and small farms. However, this is only valid for perfect factor markets.

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<sup>49</sup> Cf. appendix 3.

<sup>50</sup> Cf. chapter, 2 paragraph 2.8.2.

BISNWANGER et al. (1995) explain the variety of farm size distribution and productivity structures as a multiple market failure. In different analyses he shows that, assuming credit and rental markets are perfect, a difference in productivity exists between large and small farms merely because of differences in efficiency in the input factor labour. Farms depending mainly on hired labour are at a disadvantage compared to family farms because of transaction costs in terms of productivity. BISNWANGER et al. (1995) reach the conclusion that a negative relation between farm size and land productivity is likely to emerge because of imperfect input markets.

There have been a great variety of studies concerning size and productivity in South African agriculture, but the results have differed every time. On the one hand, statistics show that 30% of the largest farms generate more than half of the total gross farm income (CSS 1993). On the other hand, subsectoral efficiency analyses have shown an increase in factor efficiency between small and medium-sized farms, before decreasing again on larger farms (HATTINGH 1986). In maize farming areas a scale effect could only be proved in the 50-300 hectares range. The evidence concerning economies of scale in South African agriculture is mixed, but many analyses give reason to believe that the occurrence of scale efficiency is caused by policy distortions. A large majority of agricultural production function studies, including some conducted in South Africa, have found either no or little economies of scale (BISNWANGER et al. 1993).

VAN ZYL (1995) used data from South African commercial agriculture between 1975 and 1990 as the basis for an efficiency study. Farm size is adjusted for differences in land quality within regions by using land value to standardise areas. Farmers' input and output prices are the same, which implies that the monetary value of inputs and outputs can be treated as quality-adjusted quantities.

The results show a negative relationship between farm size and efficiency for commercial agriculture. The total factor productivity (TFP) index of the bottom third is larger than that of the top third. The TFP differences have different results in the respective regions. The negative relationship between TFP and farm size decreases after 1985 with the cutting of privileges for large-scale agriculture. For smaller commercial farms the labour-machinery ratio is significantly higher, which indicates that small-scale commercial farming is much more labour-intensive.

The differences in efficiency in the various periods illustrate the influence of agricultural policy and state intervention. From the viewpoint of agricultural structural policy, the public costs (i.e. the social efficiency) of an interventional policy are important. In order to

analyse social efficiency, data from 1981 to 1989 collected in the regions with the smallest and largest difference in TFP, and the social opportunity costs for labour, capital and other inputs were analysed. The respective periods at the beginning and then at the end of the eighties represent the efficiency situation before and after agricultural policy liberalisation. The TFP analysis was repeated, investigating social opportunity cost instead of private opportunity cost. The results show:

- (1) The average TFP is lower than average private TFP in all regions.
- (2) The difference in TFP is largest during the early eighties, which indicates to what extent policy had a distorting effect.
- (3) Larger farms are less efficient than smaller ones. This results from the difference in importance of capital and labour, depending on the farm size.
- (4) Since the social opportunity cost of labour is lower than the wages, and the social costs of capital are higher than the subsidised prices farmers face, the total value of inputs of large farms increases and vice versa.

Policy is an important factor in farm size efficiency. Although South African agricultural policy was particularly favourable towards large-scale farming, it could not set off the disadvantages concerning labour supervision and transaction costs. The results prove that economies of scale result from imperfect markets. However, the cost associated with hired labour in many cases more than offset this advantage over smaller or family farms. The efficiency losses of large farms occur mainly in connection with labour. This is an indication, possibly the most important one, that family farms are the most efficient organisational form in agriculture.

## **5.5 Summary and results**

The development of a large-scale commercial agricultural sector in South Africa was promoted by the state mainly through subsidised capital and distortions in the labour market.

The labour market in particular was marked by state intervention. The separation of the agricultural and industrial labour markets guaranteed a surplus of agricultural labourers. In general labour competed with subsidised capital, with the result that wages for agricultural labour were very low. Investment in agriculture was extensively subsidised and the effective real interest rate was negative throughout most of the period 1950-1980. Insolvent enterprises were granted favourable credit and this prevented the sorely needed

transformation from occurring. The political influence of farmers via the SAAU on the Minister of Agriculture was not insignificant. This led to a marketing system that favoured large-scale agriculture in which commercial farmers would play an important role in policy formulation.

Household income in subsistence agriculture is determined by migrant labour. While being dependant on the life cycle of a household, the opportunity costs of agricultural labour differ for each of the household members, but as a rule they are significantly higher than the marginal productivity of subsistence production, which is often almost zero because of the low prices of subsistence foods. In many cases it is more economical for the household to obtain its foodstuffs on the market than to produce them, and this renders subsistence farming meaningless for many households.

Scale effects in commercial agriculture are only recorded to a slight extent. In fact, it would be more correct to say that scale effects occur predominantly in imperfect markets. In a market structure of this kind there is a negative correlation between farm size and efficiency in commercial agriculture. Smaller enterprises are generally more labour intensive and their factor productivity is higher, especially when the public costs of the interventionist policy are taken into account.

**PART FOUR**  
**A ROAD TO AN AGRICULTURAL FUTURE**

## CHAPTER SIX

### ECONOMIC POLICY OBJECTIVES AND AGRICULTURE IN SOUTH AFRICA

#### 6.1 Introduction

Policy is often described as “the art of the possible” or the “lowest common denominator”. In a market economy policies create the framework within which individual economic subjects are active. Besides structural policy *Ablaufpolitik*<sup>51</sup> is used by the state to regulate the money, goods and labour markets. Intervention distorts the market equilibrium, *pareto* conditions can no longer be attained and this results in welfare losses. LIPSEY and LANCASTER (1956) showed that intervention in distorted markets, which under *pareto* conditions would lead to welfare losses, actually lead to welfare gains. Practical policies aim to increase the net welfare of an economy. Distortions on world markets, especially in the agricultural sector, are manifold. Therefore interventionist agricultural policies are employed in order to minimise welfare losses.

This chapter will deal broadly with basic social aims before exploring the various subordinate objectives in their hierarchical order. The optimal conditions for obtaining and disposing of income in society will be considered in connection with the objectives of economic policy. The contribution of agriculture to the economy concludes the general section concerning the objectives of economic policy. Finally, the interests of South African agricultural policy will be considered, where the focus will be mainly on the aims of structural agricultural policies.

#### 6.2 Basic socio-political objectives

In the category of basic socio-political objectives a distinction can be made between general socio-political objectives and politico-economic objectives. According to HENRICHSMeyer et al. (1991), socio-political objectives include freedom, security,

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<sup>51</sup> The German word “*Ablaufpolitik*” refers to price and quantity policy as well as tax and subsidy policy. “*Ablaufpolitik*” affects microeconomic and macroeconomic variables in an economy and is not exclusively used in the context of agricultural policy.



prosperity, justice and social peace. Structural policy in particular is used in the shaping of legal, organisational and administrative framework conditions, while *Ablaufpolitik* mainly influences the prosperity of a society.

The general basic social objectives have to be specified more closely in view of economic policy shaping in the constitution and laws of a society. The objectives of economic policy are formulated by the government and by the members of society. They are substantiated by the theory of economic policy and, in the case of agriculture, particularly by welfare theory. The objectives of agricultural policy take the third place in the hierarchy of objectives. Under the distribution objective one can summarise the agricultural income, state expenditure, and poor households' income. Besides allocation objectives, agricultural policy pursues efficiency objectives such as intersectoral allocation and environment quality.

In the hierarchy of economic policy objectives HENRICHSMEYER and WITZKE (1994) mention the following:

- (1) Efficiency of intersectoral and intrasectoral allocation of labour and of environment quality.
- (2) Distribution amongst sectors, single households and amongst present and future generations.
- (3) Stability of consumer prices, the producer income and the balance of payments.
- (4) Economic freedom in the sense of a liberal agricultural constitution, the promotion of competition and independence.

The objective of economic freedom and stability has already been addressed as one of the socio-political objectives and will not be discussed further in this context. Rather, the objectives of distribution and efficiency should be considered from a macroeconomic point of view and discussed further.

The focal point of the objectives of efficiency and allocation is the optimal structure for production. In general it is accepted that the existing factor components must be incorporated into the production process in such a way as to maximise the need satisfaction of society. Efficient production requires that all production factors have the same marginal product in alternative applications.<sup>52</sup> Production and consumption are to be aligned in such

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<sup>52</sup>

In practice the number of market participants often constitutes a group of manageable size. The actions of market participants are not only determined by marginal productivity but also by the behaviour of competitors. VON MORGENSTERN and NEUMANN's game theory concerning independent situations is partially contrary to the efficiency conditions of an economy, but it explains the seemingly irrational acts of economic subjects.

a way that production occurs along the transformation curve with optimal distribution of goods and that production is consumed on the maximal attainable indifference curve of society (HEMMER 1988). The objective of growth is derived from the objectives of efficiency and distribution. Because of the low per capita income, the objective of growth is one main component of developmental policies in many developing countries. It is assumed that social and political problems can be alleviated by economic growth. Processes of growth and restructuring must be adjusted so that social inequalities (e.g. distribution of income, tax burden) do not endanger the societies' increase in welfare. This also includes combating unemployment caused by modernisation, the aim being full employment (HESSE & SAUTER 1977).

### **6.3 Interrelation of objects, instruments and measurements**

A comparison of the objectives of macro-economic policy reveals the existence of different relationships between policy objectives. Certain objectives are complementary, whereas implementing some policies has negative effects on the outcome of others (rivalry of objectives) and in some cases objectives can be attained independently of one another (neutrality of objectives).

Not all objectives can be reconciled with each other in all cases. However, a high degree of conformity of objectives is preferable. Objects and policy instruments are applied reciprocally and therefore a strict distinction between objective, instrument and measure is not possible. There are various ways to reach an objective, and not all measures always have a positive effect on other objectives. The compromise between the different degrees of attaining certain objectives can be justified by estimating the objective's priorities (HENRICHSMEYER et al. 1991).

The tasks of economic policy become evident from the analysis of the actual economic situation and the extent of politico-economic objectives. The carriers of economic policy make use of economic policy instruments in order to influence economic development or to correct undesirable developments such as market failures.

## **6.4 Contribution of agriculture to the economy**

The role of agriculture changes during the different stages of agricultural development – in developed countries, agriculture makes a larger contribution towards the GDP than in industrialised countries. The performance of agriculture is not restricted to food production; however, the production contribution to economic development has to be mentioned first. Agriculture produces foodstuffs and raw materials, which are used to provide food for the country's population as well as primary products in the processing industry. Securing the provision of food is of great importance in developing countries in particular. Very often a traditionally oriented agricultural sector must provide food for the industrial sector. In the industrialised nations there is a greater emphasis on agriculture as a provider of raw materials for industrial products.

The agricultural sector is a market for non-agricultural products and services, which flow into agricultural production as inputs. The proportion of inputs is higher in the agricultural economy of industrialised nations than it is in that of developing countries. However, the contribution towards economic development is insignificant compared to the situation in developing countries.

The factor contribution of agriculture to the economy is mainly limited to the factors of labour and capital. The provision of capital for industrial development is not easily recognisable, mainly because of the complex mechanisms of transmission/transfer. Nonetheless, agriculture creates capital in the form of goods, money as well as human capital. The labour factor is generally the most significant. As a population increases, labourers who find no employment in other sectors are absorbed by the agricultural sector. As the economy develops, agriculture releases labourers for non-agricultural sectors. Thus the factor contribution of agriculture is the focal point of the classical development theory of a dualistic economy. The labourers released from agriculture attain a higher marginal product in the modern sector (SCHÄFER 1983). The dualism theory presupposes that the marginal product of labour as well as the agrarian excess increases in the agricultural sector. This excess of capital can be transferred to the modern sector, and increases the accumulation of capital and the development of an economy (RAINS 1988).

In conclusion, the contribution of agriculture to the balance of payments of an economy should be mentioned. Many states trade with agricultural products in order to make use of the comparative advantage in the production of an agricultural product, and in this way

valuable reserves are generated (APPLEYARD & FIELD 1994). Agricultural exports revitalise foreign trade and make an important contribution to the balance of payments. A sensible development in agriculture leads to an improvement of the quality of life in rural areas and thus ensures an increase in wealth for a large sector of the population. However, it is important to note that the development of agriculture can only be seen as a first step in such development. The fight against poverty requires the establishment of private sector structures of trade and craft (BASSELER et al. 1995). An efficient agricultural sector forms the basis of successful industrialisation.

### **6.5 An agricultural policy framework for the RSA**

In order to achieve an increase in wealth for all sectors of society, future policy in South Africa should be determined more strongly by intra- and intersectoral economic rationality. All interest groups within a specific sector should have equal recognition in the decision-making process. All groups should have fair access to the policy-making process. The access of single agricultural lobby groups to political power should not be the major determinant of state agricultural policy. General macroeconomic policy has a major effect on agriculture and therefore public compensation payments to agriculture have to be equitable to all groups and farmers, which includes South Africa's black farmers, part-time farmers and tenant farmers, who were disadvantaged in the past (VINK & KASSIER 1991). Generally speaking, the main problem South Africa faces at present is an inequitable distribution of resources. More specifically, the agricultural sector is grappling with the existence of two different, almost completely opposite sectors. It is now the task of policymakers to set the framework conditions for the development of agriculture in order to make efficiency gains in the commercial as well as the subsistence sectors possible. Imperfect markets and differing starting points in terms of a lack of capital and knowledge in the subsistence sector are still impeding transformation. Structural agricultural policy should, in the interest of national agricultural efficiency gains, balance out the differences in starting points.

In the restructuring of the South African agricultural sector, an efficient organisational form of agriculture should be at the centre of structural agricultural policy. The family enterprise has in the past been able to prove itself in the subsistence farming areas of South Africa, but it must be adjusted to become market-orientated. The aim of South African structural agricultural policy should thus also be to promote family farming in all its

different forms. Part-time farming also allows for an efficient use of resources. Family farming promises to be a most effective use of resources and it results in maximal outcome of dynamic effects for rural areas.

Future developments will have to include revitalisation of the commercial sector, development and commercialisation in the present subsistence sector and reallocation of some of the land. The land prices should be on the level of capitalised agricultural return and the transaction costs should be low in order to support structural changes. The most efficient and cost-effective way for such transformation to occur would be via the market mechanism (VAN ZYL 1996). However, it would make sense to accompany this process by an adjusted social policy in order to minimise negative effects.

The agricultural sector has to increase efficiency, equity and employment sensitivity by moving towards a more diversified farm structure centred on competitive commercial owner-operated family farms. These farms should not be dependent on subsidies and government support for their sustainability, but should primarily be supported by the private sector. The role of government should be to establish a comprehensive legal, institutional and policy framework which would include reliance on markets, privatisation, deconcentration and decentralisation.

## **6.6 Summary and results**

Some of the basic policy objectives of a society are freedom, security, prosperity, justice and social peace. These are specified in structural policy and *Ablaufpolitik* in more detail and lead to different economic and agricultural policies, which are aimed at securing efficiency, stability and economic freedom. Efficiency in production and consumption as well as the utility-optimising allocation of production factors are indispensable for economic growth. Not all objectives can be reconciled. However, it is desirable for the objectives to coincide to an extent so that a high degree of conformity between the various objectives is desirable for the correction of market failures or other undesirable developments which might ensue.

One way in which agriculture can contribute towards economic development is through the production of food and raw materials for industry. Over and above the contribution to production, the agricultural sector functions as a market for industrial goods and a provider of labour and capital. As the agricultural sector develops economically, it releases labourers for the industrial sector. Furthermore, the contribution towards the balance of

payments needs to be mentioned – in developing countries foreign trade often constitutes a significant part of this contribution.

South Africa's agricultural policy should, in future, be determined to a greater extent by intra- and intersectoral economic rationality. Structural agricultural policy must create framework conditions which will enable the restructuring of the commercial sector as well as promote small-scale farming via the market mechanism. The ultimate objective is to utilise the resources within the framework of family farming in its various forms as efficiently as possible.

## **CHAPTER SEVEN**

### **AGRICULTURAL POLICY CHANGE: IS A FAMILY FARMING SYSTEM A VIABLE FUTURE OPTION?**

#### **7.1 Introduction**

In practice agriculture and the economy in general are influenced by a variety of factors. The development of an economy is not always dominated by the optimal conditions set out in economic theory and the policies it produces. Liberal economic policies can interfere noticeably with social peace and can thus not always be implemented as such. Furthermore, domestically orientated policies can have virtually no effect if international influences dominate structural development within a country.

LIPTON (1996b) argued that because of the policy interventions described in chapter five, SA agriculture did not maximise its contribution during the transformation process. It could have employed more labour, if changes in crop-mix; incentives; research and institutions favouring higher labour-capital and labour-land ratios on farms of all sizes; and redistribution of land, water and services towards smaller, more labour intensive units would have been made. The question is can this be turned around?

The previous chapter contained a general overview of basic socio-political objectives and the objectives of economic and agricultural policies. In this chapter the focus will be on real agricultural policies and the current as well as the future situation facing South African agriculture.

After a brief look at the primary effects of the liberalisation of the agricultural market that has already taken place, a forecast of the structural and organisational developments in the commercial and subsistence sectors of South African agriculture will be attempted. The prevailing trends in South Africa are compared to the developments in German agriculture and tested for conformity with the theoretical spatial organisation in agriculture in the location theory. In the final part of this chapter, the current as well as future opportunities for family farming will be discussed within the context of the trends that have been identified.

## 7.2 The liberalisation of agricultural policy

Transformation had already begun to take place in South Africa's agricultural policy before the political changes came into effect. Capital subsidies and tax relief possibilities for agriculture were reduced at the end of the eighties.<sup>53</sup> The political changes in South Africa resulted in a re-assessment of its agricultural sector. Subsistence agriculture became one of the focal points of agricultural policy and the budget for agriculture was adjusted accordingly. Direct budgetary expenditure on agriculture has been changed, including a proportional increase in budgetary transfers to the Department of Agriculture in the former homelands and a corresponding decrease to commercial agriculture (SPIES 1997). The current agricultural structure which comes as a result of decades of preferential treatment is regarded by the government as inefficient and as one main reason for the underdevelopment of the subsistence sector. One of the objectives of the new agricultural policy is to bring about a transformation in commercial agriculture by achieving a more equitable distribution of land through the Land Reform Programme (LRP). The government expects to achieve significant growth by increasing black small-scale farmers' access to land in the agricultural sector.

The agricultural policy of the past two decades has been dominated by increasing deregulation and market liberalisation. The deregulation of the agricultural sector started outside agriculture in the late 1970s when the financial sector was liberalised (VINK 1993). As a result of a sharp rise in interest rates and the worsening of farmers' terms of trade the agricultural sector came under pressure to deregulate (KIRSTEN & VAN ZYL (1996). However, the deregulation that had been taken place since the 1980s was piecemeal and uncoordinated with the result, that any policy changes could be easily reversed. In agriculture, however, direct policy changes had to wait until 1996, when a radical agricultural policy reform was introduced by the ANC government (KIRSTEN & VINK (1999).

The latest liberalisation of the agricultural sector was partly continued against the will of white farmers and interest groups.<sup>54</sup> Agricultural policy aims at increasing the efficiency of the agricultural sector and at limiting state intervention. Almost all subsidies for

<sup>53</sup> Cf. chapter 5, paragraph 5.5.2.

<sup>54</sup> This could be achieved with relative ease by the new government since it did not have to take the interests of that part of the electorate into account.



agriculture were abolished and the marketing of agricultural products was left to the private sector, mainly because the state budget was burdened by agricultural expenses and this was complicated by the budget deficit. State service provision to the commercial sector in the field of research and technology transfer was reduced and in some cases even abolished (CRONJE et al. 1999).

The producer price level has decreased significantly as a result of the liberalisation of the market and, in the case of several products, it is currently determined by global market prices. The difference between domestic and global market prices is mostly a result of transaction costs such as transport costs.<sup>55</sup> Along with New Zealand and Argentina, South Africa is one of the countries (internationally) with the lowest level of subsidies and intervention in agriculture.<sup>56</sup>

### 7.3 The primary effects of policy liberalisation

The policy of market liberalisation in agriculture is, in principle, supported by almost all South African economists. There are some disputes concerning the extent and rate of subsidy cuts, especially amongst the affected group, i.e. farmers. Farmers have had little time to adjust to the changed framework conditions. Because of the disruptions in income, the financial situation of many farmers, which had been tense to begin with, resulted in an increase in bankruptcies (SPIES 1997). However, the increased competition is especially tough for some agricultural subsectors. In areas where few or no alternatives to existing production and marketing are possible, a particularly dramatic transformation is necessary. Other subsectors such as the maize industry were able to adapt reasonably well to the new market situation (BOWAN et al. 1999) and are thus currently in a comparatively better position than, for example, the wheat industry in the Western Cape (VINK et al. 1998). In the past land prices were determined by the structural segmentation of the land market, the degree of subsidisation of commercial agriculture, the macroeconomic environment and the profitability of farming. Land prices tended to increase as the remaining factors of production became more favourable and vice versa.<sup>57</sup>

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<sup>55</sup> The state only intervenes by means of customs when extreme fluctuations of the world market price occur in order to prevent the domestic price from sinking too low.

<sup>56</sup> The only subsidies that still exist are tariffs imposed on imported agricultural inputs and tax relief for direct foreign investment in agriculture.

<sup>57</sup> Land prices rose when the real interest rate was negative because of capital subsidies, but they decreased when the subsidy level for intermediate input factors declined.

Up to now, the transformation in commercial agriculture has been a conditional one. Before the political changes took place, approximately 4-5% of agricultural area was transferred annually on the market. Between 1982 and 1990 the land prices in the summer rainfall areas fell by 45% in real terms (SPIES 1997). It can be assumed that the crisis in commercial agriculture has resulted in an increase in market land transactions. In the KwaZulu Natal region 7% of the 5,3 million hectares estimated to be available for redistribution in the province, were transferred across the market in 1997. Transfers to previously disadvantaged group representing only 6,2% of the farmland transferred or 0,43% of the total area available for redistribution. More than half of this land transfer has been transacted with government assistance within the context of the Land Reform Programme (LYNE 1996).

Transformation in marketing of agricultural products is much more advanced than in production, although considerable deficits still exist in the opening up of the domestic low-income markets. The food consumption of the low-income group is bound to increase due to increasing urbanisation, greater purchasing power and the positive income elasticity of demand for food (MYBURGH & KARAAAN 1992). In regions close to the markets there is great potential for serving these markets.

With deregulation, most farm gate (producer) prices dropped in real terms, and have stayed down because of the threat and reality of competition from imports. Yet consumer prices continue to increase, although at a lower rate. Farmers' terms of trade cause net farm income to decline at an alarming rate. This, while farmers have an incentive to sell into the informal sector, they still face a cost-price squeeze.

#### **7.4 Potential future development of commercial agriculture in marginal farming areas**

Low producer prices in South African agriculture keep the profits of agricultural production down. In theory, this means that the income function of the commercially orientated household is flatter. Assuming *ceteris paribus* conditions on the input cost side, the intersection of the cost and income functions shifts to a lower level when the household acts rationally and employs fewer inputs. In effect, this is a reduction of production intensity. While the level of inputs remains unchanged, profit can no longer cover production costs.

### 7.4.1 Extensification and diversification

There is a world-wide tendency for a decrease in production intensity and an extensification of production when producer prices sink.<sup>58</sup> This is particularly true for market-remote locations or those disadvantaged by natural conditions.<sup>59</sup> In South Africa, under the current agricultural price level and the relatively high transport costs, many market-remote locations became marginal production locations. Risk increases with increasing specialisation in production of few or just one single crop.

As a result, it can be concluded that in South African agriculture more market solutions in terms of organisation in agriculture and in cropping patterns arose. Not all farms have been fully adapted to the liberalised market by all. Commercial agriculture in South Africa should have developed towards more extensive and diversified production patterns, especially in market-remote areas. Remote farms aren't getting smaller, contrary to household theory. A reduction of farm size would further decrease the total profit and increase the risk if the commodity use of production (low-value crops) were to stay unchanged.

A tendency of increasing adoption to the risks and opportunities of the market can be noticed. Farmers attempt to integrate different sectors of industry in order to diversify their production. This could mean that on a single farm, in addition to maize and cotton farming, cattle or other livestock would be held in order to provide a better buffer against possible losses of income caused by weather and price inconsistencies. In the first phase, extensification of field crop production results in the reduction of a specific intensity or to a changed cropping pattern.. In the second phase it could lead to the integration of more alternatives for land usage. In this way farmland could be used for pastureland or pastures could be used extensively as game farms. Because of the harsh climatic conditions in SA there is a trend towards more natural pastures and extensive environmentally conscious use of land.<sup>60</sup>

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<sup>58</sup> The reaction by farmers to price decreases known as inverse supply behaviour is an exception to this. However, it can only be observed in connection with "sunken costs" and as a short-term reaction as long as the variable production costs can still be covered.

<sup>59</sup> In his 1826 book "The isolated state", VON THÜHNEN explained the basic principles of the theory of spatial organisation of land use and its implications in terms of production and technology.

<sup>60</sup> KLEYNHANS & LIEBENBERG (1994) pointed out that, out of the 15,14 million hectares of cultivated land in South Africa in 1990, 0,45 million hectares were considered to be 'not arable' under the present state of technology and should not have been cultivated. The South African Department of Agricultural Development (1990) classified 13% of the natural pastures (veld) as being in a bad condition. According to the Department, the natural pastures presently have grazing capacity of 8,1

The pressure of nearly a decade of policy reform has already resulted in a greater diversity of farm size in some parts of the country. Greater diversification and increased competition requires greater management skills which implies a smaller farm size or professional managed agriculture. Diversified agriculture will in fact tendentially result in more family farms, but this will probably be only the case in market-proximate high-value cropping areas. In remote areas agriculture will probably be dominated by diversified low-value cropping larger scaled farms as long as there is an oversupply of cheap labour in the rural areas. According to SPIES (1997), farms in marginal cropping areas become bigger as low input cropping practices are adapted or as farmers switch over to livestock farming. If the effect of the lowering of producer prices on household income in commercially farmed marginal cropping areas is analysed in connection with the probable future producer price level, it cannot be expected that farm size will experience a dramatic decrease in South Africa. In fact, the opposite is true – in the marginal cropping areas all adjustment strategies such as diversification and extensification point towards an increased use of land as a production factor. The farm size in these areas is expected to increase rather than remain constant.

This process is supported by the increasing flexibility of agricultural production, particularly with respect to production factors. Pressure from policy reform has led to a clear-out effect on farms. Unprofitable farming activities were given up so that farmers could concentrate on more profitable farming activities; unproductive land has been sold to enable farmers to invest in more profitable farming activities. According to VAN ROOYEN (1999), the clear-out took place during the past few years on most farms and has been concluded. The low land prices favour financially sound enterprises. Farmers can expand their land resources to more favourable conditions in order to diversify production to become more efficient and reduce risk.

#### **7.4.2 Horizontal integration**

A second strategy used to secure income in commercial agriculture could be co-operation between enterprises. In farming activities which have high fixed costs or which make little use of certain farm equipment, there is a possibility of communal use. This has great potential to reduce production costs, particularly for mechanisation.

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million LSU. However, in the 1990s 13,3 million LSU were kept on South African natural pastures, which is an over-utilisation rate of 55%.

A strictly rational, savings-orientated approach can often help to reduce fixed costs by optimising the use to full capacity. The realisation of the co-operative rent depends on the transaction costs of the potential partners. Where low or no transaction costs are present it does not really matter how the production factors and rights are distributed, since an efficient solution will always be found.<sup>61</sup> However, it is often the case that the transaction costs prevent a favourable outcome to negotiations because of non-rational actions and co-operation rent can thus not be determined.

The gradual integration of two or more enterprises is another way of reducing costs in commercial agriculture. In this way individual enterprises can achieve diversification or extensification without great financial risk. Optimisation of production and management processes in this type of co-operation between enterprises can improve profitability as a whole.

A further possibility is common investment in farming-related activities. There is a competitive disadvantage in the production of low-value crops in market-remote farming areas because of transport costs.<sup>62</sup> Here the question arises whether it would be possible to achieve value-adding to the primary product on the farm (COETZEE & CRONJE 1999). The joint operation of a mill or a processing or packaging plant contributes to increasing the value of the produced goods. A higher degree of processing could improve the competitiveness of marginal, market-remote positions (SAXOWSKY & SAXOWSKY 1999). The lower the agricultural income and the more capital-intensive the enterprise expansion, the greater the need for closer co-operation amongst farmers in the future. However institutional framework of the "traditional" producer co-operatives of the past is less suited to push the inter-enterprise integration process forward. The main problem of a co-operative is the inefficiency in the decision-making structure concerning the allocation of resources.<sup>63</sup> Inter-enterprise integration can be achieved most efficiently with a small number of farmers. Initial and non-committal co-operation can occur on the basis of agreements or contracts. In the case of closer co-operation between branches of an industry, forming of an association under the civil code becomes an option. Private agreements amongst farmers and small companies will increasingly lead to advantages

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<sup>61</sup> This relationship is described by the COASE theorem. Efficiency and constancy can only be determined under the assumption of no transaction costs and complete information.

<sup>62</sup> VINK et al. (1996) determined by means of a linear programming model for the Western Cape that transport costs have a significant influence on wheat production and income.

<sup>63</sup> Cf. chapter 4.

compared to the “traditional” producer co-operatives, since the organisational and decision-making structures of the former are more successful in lowering transaction costs.

### **7.4.3 Vertical integration**

Besides the “normal” transformation, the trend towards industrial, large-scale agriculture will increase in some aspects. This development can be detected in American pig farming and processing as well as in the European agriculture. An industrialisation of some agricultural sectors has taken place in the farming regions of East Germany and Hungary after the fall of centrally planned large-scale agriculture (RASKO 1999; TILLACK & SCHULZE 1998). Frequently the formation of large-scale agriculture (i.e. large compounds of enterprises) starts with the compounding of enterprises in the processing industry such as abattoir industry (SAXOWSKY & SAXOWSKY 1999). In South Africa this trend has been quite pronounced in the poultry industry. The concentration and industrialisation in the abattoir industry has led to the formation of oligopolistic structures.

Increased standardisation of the production process promotes the formation of large enterprise structures. Future agricultural production does not generally take place in large-scale units, since transaction costs rise disproportionately along with an increase in size. In contrast, BONNEN & SCHWEIKHARDT (1997) identified huge transaction cost advantages by transforming smaller scale farms into professionally managed large industrial operations in U.S. agriculture. This will necessitate an intensified vertical integration of production, processing and marketing. Integration provides individual commercial farmers with the possibility of improving their market access by contracting with larger enterprises. It will also enable manageable, efficient agricultural production structure. Contracts of this nature could also provide a better market position for post-land reform, small-scale commercial agriculture.

## **7.5 Future development of commercial agriculture in market- proximate areas**

Commercial agriculture close to or even in the direct area of influence of the major metropolitan areas and the relatively densely populated former homelands have a transaction cost advantage over market-remote producers. This transaction cost advantage is not restricted purely to transport costs, but favours producers that have a direct, strong,

consumer-orientated marketing strategy. Furthermore, the direct marketing possibilities provide more product alternatives to the conventional low-value crops.

Changing production from low-value crops to higher-value crops such as fruits, vegetables, flowers or medical plants is always an alternative to conventional production. However, smaller farm units and direct market access facilitate specialisation in high-value crops. Faced with stagnating producer prices for low-value crops, there is no alternative for specialising in higher-value crops or consumer-orientated marketing from an economic point of view, since the opportunity costs of land use are higher than in market-remote areas (VON THÜNEN 1826).

### **7.5.1 High-value cropping and direct marketing**

The cost of the use of land that is situated near the market is influenced by higher-grade alternatives such as vegetable farming, recreational use and also residential and industrial purposes. An increase in land prices independent of its natural fertility can always be observed in the area influenced by the urban economy. Extensive use of land is not profitable because of the high opportunity costs of land use.<sup>64</sup> According to the current trend of intensification, small-scale, high-value crop commercial agriculture will probably increase in the future.

Higher income will not only be achieved by specialising in the production of high-value crops, but primarily also by the indirect marketing of products to the consumer. The possibilities of direct marketing are not restricted to niche markets or on foodstuffs that were produced in a certain way that would appeal to a small group of consumers. Large parts of the low-income market do not have formal marketing structures and are virtually predestined for the direct marketing of food. The newly urbanised low-income groups have specific traditional consumption habits and needs that are not taken into consideration by conventional retail traders or are in some cases not possible. Many consumers are also unable to participate in the formal market for logistical reasons (MYBURGH & KARAAN 1992).

Commercial agriculture close to urban, low-income communities should specialise in the direct servicing of this market. The potential of this market will further improve in the

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The central point of VON THÜNEN's theory is location rent. In his theoretical model location rent decreases as distance from the centre increases. The manner of land use is determined by the amount of location rent and this results in the creation of the typical VON THÜNEN circles.

future because of increasing urbanisation and incomes and it holds great opportunities for greater profit on agricultural products for a wide variety of commercial farming enterprises. Absolute farm size will play a subordinate role. The priority of agricultural activities should lie in the farming and the customer-orientated marketing of foodstuffs. Because production occurs close to the market, land becomes an expensive input factor. The trend indicates a move toward medium or small-scale intensive production.

### **7.5.2 Multi-functionality of agriculture**

There is a growing market for agricultural products in connection with services. Here, agriculture no longer focuses on food production, but functions as a recreational service provider. Agriculture, therefore, develops a multi-functional character. The nature of production and integration into the natural environment and the appearance of production and consumption areas become the measure of the value of an agricultural product. An increasing part of the product price falls to the product-related service and to the availability of positive external effects of production, such as maintaining the cultural environment. The increasing value of recreational time provides many opportunities for agricultural service provision and the use of nature close to conurban areas. As far as tourism is concerned, there is a potential for agricultural service provision not only in areas close to cities. This can be seen from the successful integration of tourism and environmentally conscious land use in the natural veld of the Northern Province and Namibia.

Currently, the marketing of agriculture as a service provider is a small but lucrative market that has become an influential economic factor in agriculture, specifically among wealthy consumers. Commercial farmers should become aware of the increased importance of multi-functional agriculture in pre-destined areas, take on the challenge of this new market and make use of the opportunities of this type of land use.

### **7.6 Future development of subsistence agriculture**

The main priority of agricultural policy is the development of the subsistence sector and increased access of formerly disadvantaged communities to agricultural resources. Therefore, the government implemented a Land Reform Programme (LRP) with the main objectives of redistribution, land restitution and land tenure reform.



The economic situation of subsistence agriculture has remained unchanged over the past few years. It is still conducted almost exclusively in the regions of the former homelands on tribal and state land, and in some cases on freehold land. Politically and legally the new government has set the conditions for a commercialisation of subsistence agriculture. Formerly disadvantaged population groups have free access to all agricultural resources.

### **7.6.1 Forced co-operatives**

Since 1995 the government's main tool in land redistribution has been the land access grant. In terms of this programme landless people may apply for a cash grant of R15.000 to purchase and develop farmland. Extensive land transfers to disadvantaged owners have not occurred as yet, although an increase in the rate of land redistribution has occurred since 1995 (KIRSTEN & VAN ZYL 1998). Households usually have to pool their grants in order to buy farmland. In most cases these farms settled by a group of households are too small to support all of the beneficiaries as full-time farmers. There are administrative problems, since only some of the equal partners in this forced "co-operative" can take over the management. In practice the other members are more or less dependent farm labourers. This was not the original aim of the land grants. In addition, there are conflicting opinions among the equal partners in co-operatives of this nature, resulting in specific management and decision-making problems and disadvantaging production co-operatives compared to other organisational forms.<sup>65</sup> Land grant pooling is an opportunity to obtain larger quantities of land, but profitable agricultural use of such land seems problematic (KIRSTEN & VAN ZYL 1998).

### **7.6.2 Equity sharing schemes and contract farming**

A promising way to involve previously disadvantaged population groups in commercial agriculture is by way of equity sharing schemes, especially in high-value crop farming such as the deciduous fruit industry. Land can be transferred to farming companies in which equity is shared between a commercial farmer and his disadvantaged employees. In 1997 the Department of Land Affairs allowed farm labourers to finance equity with a land grant. This made the financing of equity transfers by farm labourers much easier. Equity

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<sup>65</sup> Cf. chapter 4, paragraph 4.5.

financing schemes seem suitable to enable farm workers' participation in their enterprise and thus will play an increasingly important role in the future.

KIRSTEN & VAN ZYL (1999) mention important prerequisites for a successful partnership between farm labourers and the owner. Their conclusion is that the equity sharing option is likely to be effective amongst the 30% of top farmers' groups, where good business practices and enlightened labour management processes are already in place.

In some agricultural sectors such as the sugar, tea and coffee industries, a type of contract farming on a small scale is imaginable. Landless farmers would buy small pieces of land from large-scale operations in order to farm the land as their own responsibility (SPIES 1997). Financing can occur through government or bank grants. However, it would be more practicable if the respective processing enterprises such as sugar mills or exporting organisations were to take over the financing, since direct ties between small-scale production and commercial marketing can be established in this way (LYNE & DARROCH 1997). A crop that is particularly suited to this type of system is sugar cane, since there is virtually no market other than sugar mills and repayment of loans can be secured in this way.

### **7.6.3 The role of the market**

In all probability the greatest contribution by far to the development of black agriculture will occur via the market. In this respect reform of the laws relating to the leasing of land is an important factor. If private law elements of land lease can be integrated into the system of communal land rights in future, opportunities will be created for landless households to conduct self-responsible subsistence or semi-subsistence agriculture. Furthermore, it is also imaginable that a group of potential farmers or an entire community will lease commercial farmland in order to expand their agricultural resources within the framework of communal land rights. The main proportion of land transactions to the disadvantaged population group already takes place via the free market without any government assistance (KIRSTEN & VAN ZYL 1998).

Different opportunities are available for the promotion of agriculture of formerly disadvantaged population groups. From today's perspective all measures within in the context of the LRP are not effective and will in all probability only lead to the transfer of an insignificant part of arable land, although extensive public means are being implemented (RSA & EUROPEAN COMMISSION 1997). It is not impossible that the LRP

could be abolished due to high costs (bureaucracy) and low effectiveness. In the reform of subsistence agriculture, market solutions should in all instances take precedence over state programmes, since such reforms provide lasting agricultural prospects for small-scale farming (KIRSTEN & VAN ZYL 1998).

In all probability a fundamental change of subsistence agriculture will not be achieved in the mid-term, although a concentration of agricultural resources can be expected.<sup>66</sup> Poor households cannot afford subsistence farming in the long run and will sell the agricultural resources they obtained with the help of government grants. These will be purchased at lower prices by wealthier households.<sup>67</sup> In future a concentration of resources could lead to a more commercially-orientated use.

### **7.7 Commercial agriculture in SA: An international comparison of agricultural trends**

Not only the structure but also the direction of change in the organisation of agricultural production and marketing seem to be developing differently, depending on whether the position is one close to or remote from the market. Market-remote positions in the RSA are additionally disadvantaged by harsh natural conditions and thus a trend towards extensive agriculture has developed. Positions close to the market tend towards more intensive, consumer-oriented agriculture.

Where the structural and organisational trends in SA commercial agriculture are compared with the development of agriculture in Europe and specifically of that in Germany, astounding parallels can be seen. German agriculture is also characterised by structural dualism (BML 1995) that is partially more predominant compared to the tendencies in the development of SA's commercial sector.<sup>68</sup> West German agriculture has a greater number of small farms, whereas eastern German agriculture has noticeably larger farms. Overall, there is a decrease in farm size from north to south.<sup>69</sup>

Now, it could be said that German agriculture is not comparable to commercial SA agriculture because of the differences in agricultural policy framework conditions and the

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<sup>66</sup> Already today about 30% of all cattle are kept by a small amount of households in the subsistence farming areas.

<sup>67</sup> A concentration process of this kind is indirectly promoted by the LRP but is in contrast to the objectives of agricultural and social policy which focuses particularly on poor households.

<sup>68</sup> A comparison between the average size of farms or agricultural enterprises in *Bavaria* (20,5 ha) and *Mecklenburg-Vorpommern* (272,2 ha) reveals the structural difference, which is striking despite the existence of relatively homogenous natural conditions.

position of agriculture in the respective societies. Certainly some of the objectives of the current EU and of the South African agricultural policies differ. However, the “McSharry” agricultural reform introduced a change in EU agricultural policy (SCHMITT 1993). The previous WTO agreements and the latest EU policy reforms, better known as “Agenda 2000” have resulted in a more market-orientated, less protectionist agricultural policy.<sup>70</sup> Presently German agriculture is experiencing an unprecedented lowering of producer prices (CHADWICK 1999). This will speed up the transformation process. The reaction of farmers to dropping producer prices is similar to that of South African farmers. As a result, the diversity of farm size increases, and the willingness to co-operate in order to integrate and lower production costs has seen a marked increase in recent years. The average enterprise size of full-income enterprises is increasing and the trend towards industrial agriculture cannot be overlooked in some sectors (CHADWICK 1999). However, the number of part-time farmers and the extent of unconventional agriculture has increased.

The geographic trend of development is similar to that in RSA. In the sparsely populated areas of eastern and northern Germany agricultural enterprises are becoming larger and are developing more extensive production patterns in marginal locations.<sup>71</sup> In the densely populated western and southern Germany, but also in the areas surrounding the urban metropolises in north and east Germany,<sup>72</sup> part-time farming and high-value cropping in connection with direct marketing are gaining in importance. The trend towards alternative market-orientated forms of agriculture is much higher in the west and the south of Germany than it is in the eastern parts.<sup>73</sup> Family farming is the most predominant organisational form.

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<sup>69</sup> Cf. chapter 3, paragraph 3.2.

<sup>70</sup> Despite the liberalisation of agricultural policy, the level of intervention in European agriculture is still among the highest in the world.

<sup>71</sup> In eastern Germany the average enterprise is decreasing because the transformation of the successors of former socialist large-scale co-operatives is not yet complete. However, the size of promising enterprises is increasing.

<sup>72</sup> The agricultural structure in the area surrounding Hamburg and Bremen consists of smaller structures and is clearly characterised by the urban market. In the area surrounding Berlin there have not yet been such remarkable changes in the structure of agriculture as can be seen in and around western German metropolitan areas because of the history of centrally planned agriculture in the eastern parts. However, the first signs of agricultural specialisation on urban markets are evident.

<sup>73</sup> Considering the geographical distribution of horse-keeping in Germany, it becomes evident that market proximity and the multifunctionality of agriculture indisputably influence the forms of production and organisation. The density of horse breeders in areas surrounding conurban areas is especially high, while virtually no horse keeping takes place in rural areas.

There are also similarities in the developmental trends of German and South African agriculture. The increasing regional differentiation of agriculture is a result of the liberalisation of the agricultural market, a process that is more advanced in the RSA. Interventionist policies have in the past led to distortions on both agricultural markets which restricted or sometimes even prevented a differentiation of agriculture towards efficiency. In the liberalised economic environment of RSA it is foreseeable that the adjustment process in agriculture and the future differentiation of production and the organisational form will follow the strict criteria of a market economy.

The tendencies in the current spatial organisation of land use in South Africa as well as Germany display the typical circular arrangement of land use systems around the market, corresponding to VON THÜNEN's location theory. VON THÜNEN (1826) assumed that land rent differs because of productivity and location. In his world, the optimal level of production intensity occurs where the marginal addition to yield by the final increment of capital and labour just pays for the transportation of the marginal yield to market. Rents fall with increasing distance and farm size increases because farms substitute the cheapening factor of production (land) for others in their productive process.

This can be seen in the RSA and in Germany. In market-remote areas production is more extensive than in areas close to the market; the net earning and the value of input per hectare is therefore lower. In areas close to the market predominantly high-value, small-scale production occurs, whereas low-value, large-scale agriculture dominates in market-remote areas.

The accuracy of VON THÜNEN's model and its relevance for the future development of South African and German agriculture are confirmed by the current land market. Land prices in eastern Germany and in the rural areas of South Africa are noticeably lower than in areas close to cities (BML 1999). VON THÜNEN (1826) identified similar differences in land lease depending on proximity to the market on his estate in *Tellow*.

### **7.8 An opportunity for family farming in SA agriculture?**

At the beginning of this thesis the family farming system was identified as the most efficient organisational form in agriculture. The dominance and advantages of family farming in most countries' agricultural sector is highlighted by using German agriculture as an example. The discussion of the potential future development in the SA commercial

agricultural sector in paragraph 7.4 seems to be partly contrary to chapter four's results in terms of efficient organisation in agriculture.

### **7.8.1 The commercial sector**

The classic commercial farm enterprise in South Africa employs only a limited number of family labourers, as the main labour resource is hired labour. Even if one were to expand the definition of a family enterprise to a family-managed farm organisation with a limited, manageable quantity of hired labour<sup>74</sup>, this is still an insufficient description of the structure of South Africa's commercial agricultural sector.

South Africa's commercial agriculture has been historically classified according to the commodity focus; it consists of medium to large-scale farms and is highly dependent on hired labour. The organisational form of the family enterprise, even in its expanded definition, is found only rarely. In fact, many already large-scale agricultural enterprises are becoming increasingly industrialised and are assuming a corporate farming form; contract farming appears as the most dominant and promising organisational form.

Family farming works best in a market environment that requires high management skills and flexibility of production and in labour time. As soon as standardisation in the production process take place and cheap labour is available, family farms cannot use their labour advantage and convert to larger-scaled farms dependent on hired labour. In a liberalised environment, family farms can usually adapt to the market much more easily and faster than large-scale farms, which indicates the rising farming diversity especially near metropolitan areas. South African agriculture is reacting to market liberalisation in at least three different ways:

First, the remote areas are characterised mostly by monoculture and extensive low-input crops are grown, although there are opportunities for combining cropping with more highly valued activities like game farming and tourism.<sup>75</sup> Whether family farming, even in its extended definition, will expand or not in these areas will depend on a number of factors related to the farm labour force.

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<sup>74</sup> Where, for example, the share of family labour makes up at least 25% of the total labour demand

<sup>75</sup> Cf. paragraph 7.5.2.

An important factor will be the labour supply and wage levels in rural areas. The declining profitability of agriculture in these market-remote areas coupled with the low productivity of labour will tend to hold wages at low levels. Additionally, South Africa's high unemployment rate coupled with slow or maybe failed land reform will tend to keep labour supply high, and thus also mitigate against higher wages. On the other hand, the increasing influence of trade unions and the influence of the public sector as a wage leader could lead to higher wages in agriculture, even in these remote areas. These factors favour a continuation of the structure of larger-scale farms dependent on hired labour, and the development of industrial agriculture where circumstances permit, in market-remote areas. Only VAN ZYL's (1996) farm size efficiency<sup>76</sup> argument, which is questioned by LIPTON (1996), favours smaller-scaled farms. The theoretically predicted positive effects of small-scale farming (labour intensity, factor productivity) may not hold in all areas, as has been shown in a number of case studies.

Second, the situation differs somewhat for commercial agriculture in areas closer to urban markets. Farms tend towards more vertically integrated mixed farming, often integrated with tourism and other service activities. Besides agriculture, many farmers invest in non-farm facilities such as restaurants, guesthouses or some combination of these. Most of the farm products are marketed directly to the consumer and the services are offered to a small rich urban market.

Some aspects of high-value crop production have a small-scale orientation. This applies in particular to enterprises that focus on direct marketing. Direct consumer-orientated agriculture requires a high level of management skills and flexibility. The organisational form of the "extended" family farm is able to satisfy this need and is definitely practicable in areas close to cities in South Africa's present economic environment. Especially family farming in the expanded definition will be able to expand in the future.

Third, South African agriculture as a whole will be much more market orientated than in the past. Organisational forms like part-time farming, which were hardly imaginable in the past, will become more and more common. These farmers act in order to maximise their household income and seem to adapt well to SA's present economic environment. The increased flexibility in agricultural organisation will have an affect on the land market. In order to optimise the farm size, the land rental market will become much more important than in the past.

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<sup>76</sup> Cf. chapter 5 paragraph 5.4.

The increasing competition on a liberalised SA agricultural market and a customer demand-oriented market, especially in metropolitan areas, should be conducive to the development of family farming. In areas closed to cities family farming should become more and more important and this not only in terms of number of farms, but also in contribution to GDP. However, it is doubtful whether the development towards more family farms will take place in the remote areas as well, as the evidence tends to indicate that cheap labour favours large-scale or industrial farming.

This trend is supported by the increasing world-wide trend towards global trade in production factors and consumables. Even under protectionist market conditions in Europe this trend favours larger-scale agriculture. Market liberalisation and increased international freedom of trade support the tradability of production factors. Because of technological progress, labour division and mass production, the prices of consumer goods, especially of low-value products such as foodstuffs, are decreasing. In this economic environment, the family farm is losing its competitiveness all over the world.

This is not surprising since the strengths of family farming lie in flexibility of labour time and market/consumer adaptability. As soon as low-value commodities are produced under standardised conditions and marketed internationally, family farms have to compete with low labour-cost production systems. Family enterprises are competitive in areas which are difficult to standardise, such as high-value crop production for individual local markets, agriculture combined with service provision and in high-risk production systems.

### **7.8.2 The subsistence farming sector**

Subsistence or small-scale semi-commercial agriculture is fundamentally different from commercial agriculture. The household allocation of production factors corresponds with LOW's Southern African indigenous household model as explained in chapter two. South African subsistence agriculture is dominated by family farming. Another organisational form in subsistence or semi-commercial agriculture is by definition hardly imaginable, since family labour is almost exclusively employed. The typical forms of family farming such as off-farm labour allocation and part-time farming are a norm in South African subsistence agriculture.

There are several reasons for the unsatisfactory situation of the subsistence sector, despite the dominance of the organisational forms of family farming previously identified as being



efficient: (1) the overpopulation of subsistence farming areas implies only a marginal area per household; (2) the opportunity costs of labour are high; (3) communal land rights make competition and private initiative difficult; and (4) the marginal utility of additional food production is low.

Compared to other African subsistence farming areas, family farming in the subsistence farming areas of South Africa is disproportionately dependent on non-agricultural and migrant labour. Family farming in the subsistence areas is thus quite like a survival institution. As soon as household members performing migrant labour become unemployed, they return to the subsistence farming areas until they get a new off-farm job. If it can be assumed that wages will be higher in the future, the financial transfers in the subsistence areas will probably increase further.<sup>77</sup> In the case of lower wages there will be an increased demand for wage income. Both scenarios imply a tendency towards declining intensity of agricultural subsistence production.

It is questionable whether the subsistence household can maintain its present function of providing social security of its members in the future. Especially in the case of sinking off-farm wages and increased unemployment, poorer households could be strained. The increased separation of subsistence agriculture from migration income due to increased urbanisation and the concentration of agricultural resources in subsistence farming areas in particular are a threat to poor, small households.

Despite all the problems in the subsistence farming areas, there is no practicable alternative organisational form to family farming. The development of subsistence agriculture to a more commercially oriented small-scale agriculture is only conceivable within the framework of family farming. Labour is the most important input factor in subsistence farming and can be provided at particularly beneficial rates. If this production cost advantage on the market can be exploited, there is a chance for commercialisation. In the reconstruction phase of small-scale commercial agriculture family farming is particularly suitable, since family labour does not require immediate remuneration and is even free in some cases, so that this capital can be used in alternative ways from time to time.

In order to be worthwhile, semi-commercial farms in the subsistence areas will have to be considerably bigger than the current farm units. The scale disadvantage of subsistence agriculture can't be fully compensated by cheap family labour.

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<sup>77</sup> It is difficult to predict the development of the wage level in South Africa. On the one hand, the low productivity of labour and the declining competitiveness of South African industry would lead to

## 7.9 Summary and results

The new government has continued the policy of market liberalisation that was introduced during the eighties and all subsidies for the agricultural sector have been reduced. Today South Africa is one of the countries with the lowest protection levels in the world. As a result of stagnated producer prices and increased international competition on the domestic market, some subsectors in SA agriculture are no longer competitive.

Price creation for agricultural products occurs via the markets, where the scarcity of agricultural produce and input factors becomes increasingly evident. Because of the market remoteness, increased international competition has the opposite effect on the commercial agricultural sector. Agriculture in market-proximate areas will develop into medium-scale, consumer-oriented, high-value crop production, whereas market-remote areas show a tendency towards extensification and diversification of low-value crop production. Horizontal and vertical integration will become more important in the future to sink the risks and costs involved in production so that competitiveness can be maintained in a concentrated, oligopolistic marketing sector.

Despite a variety of land reform mechanisms, it will be difficult to achieve a fundamental change of the situation in subsistence farming. Promising attempts such as equity sharing schemes and contract farming appear sporadically, but these are insufficient to initiate a changed trend in the development of African agriculture.

Comparing the tendencies in the development of the South African and the German agriculture, the increased importance of markets on the structure of agriculture can be seen as a result of the liberalisation the agricultural sector. In both countries transformation is taking place in a similar direction, corresponding with the typical circular arrangement of land use systems in VON THÜNEN's location theory. Location rent implies different costs of land use. This is the reason for the creation of different agricultural systems depending on proximity to the market.

The model of family farming can be seen to have failed in the South African commercial sector, except for a few niche markets. The number of family farms are in fact growing, but there is a tendency towards more large-scale industrialised agricultural units, even in market-proximate areas, because of an oversupply of cheap labour. The reason for the international decline in competitiveness of family farming is the increased globalisation of

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lower wages. On the other hand, the influence of trade unions in all sectors is increasing, while the oversized public sector fulfils the function of a wage leader.

the competition concerning production factors and markets. However, the strengths of family farming are particularly useful in an individualistic economic and physical environment.

Unlike commercial agriculture, the subsistence sector is dominated by family farming. However, it does not correspond to the traditional definition, but rather has the character of a survival institution. Despite all problems in the subsistence sector, there is no alternative to family farming and a commercialisation of subsistence farming is only imaginable within the context of family farming. In the future the social security system of family farming could be in danger because of the breaking-down of the symbiosis between subsistence farming and migrant labour as well as the concentration of agricultural resources in the subsistence areas.

## **CHAPTER EIGHT**

### **NEED FOR GOVERNMENT ACTION: A FEW RECOMMENDATIONS**

#### **8.1 Introduction**

Agricultural policy up to the 1989s resulted in extensive distortions in South African markets. The liberalisation of the agricultural markets was more than overdue, especially in view of the WTO negotiations, and was welcomed by domestic economists as well as by the World Bank. After the political transformation in RSA, the new government reinforced the agricultural reforms so that today almost no subsidies or indirect aid is advanced to the commercial farming sector (WORLD BANK 1994). The future development of South African agriculture and of the subsistence sector in particular is determined to a significant extent by trends in the global market and by the way in which agricultural policy reacts to these trends.

After the future opportunities for family farming have been identified in individual small-scale agriculture, this concluding chapter aims at placing current agricultural policy in a critical spotlight. This involves not only a critical analysis of the extensive liberalisation of the agricultural market, taking commercial agriculture into account, but also looking at the extensive public aid available to the subsistence sector.

Motivation for the correction of the state's land reform programme is given and the need for state action in the creation of institutional frameworks for agriculture is pointed out.

#### **8.2 Total liberalisation in agriculture: Quo vadis?**

The liberalisation of the agricultural market has led to extensive welfare gains in South Africa's economy and in particular in the state budget. However, the effect was not noticeable to consumers. Those who drew the short straw in the reform process were first and foremost the commercial farmers. Certain sectors of the South African agriculture are now limited in their competitiveness, which means that an adjustment of production seems unavoidable (VINK et al. 1996).

A liberal agricultural policy makes economic sense, but the government should not underestimate the importance of South Africa's commercial agricultural sector in providing food and employment opportunities. A decline in the commercial agricultural sector would result in economic resources going to waste as well as in a lasting reduction of jobs and foreign exchange in the form of imported food.<sup>78</sup>

It is questionable whether, in a small country in terms of the quantity of agricultural production such as South Africa, a fast and rigorous liberalisation of the agricultural market should enjoy preference regardless of the positive economic effects of a productive commercial agricultural sector and the negative effects of liberalisation to the rural society.<sup>79</sup>

Almost all countries protect their agricultural markets to a greater or lesser extent; even in countries such as New Zealand agriculture is promoted by way of indirect aid. In the framework of the WTO-Uruguay agreement it has become possible to implement green-box measures to promote agriculture. South Africa should not miss this opportunity to join the rest of the world. South Africa is currently subsidising within the green box, through the export promotion schemes of the *Industrial Development Corporation*, while tariff levels for commodities such as sugar and wheat are still high. With the use of state aid schemes such as a disaster insurance system rather than direct market-distorting tariffs, the situation in commercial agriculture could be improved. Even if it is allowed to subsidise agriculture directly, South Africa, as a poor country, can't afford to do so. Disaster insurance schemes or export promotion schemes such as implemented by the Industrial Development Corporation are cheaper ways to support the sector.

The government should be aware of the fact that the provision of food for the growing South African population can only be secured through the commercial sector. Total ignorance of the difficulties faced by the commercial sector as a result of deregulation could lead to significant welfare losses.

Limited intervention on agricultural markets can have positive effects on other sectors and markets, so that the overall effect will be positive, as shown by LIPSEY & LANCASTER (1956). Most probably the use of public means to lower the risks involved in agriculture would have a positive effect on the South African economy. In principle subsidies to

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<sup>78</sup> Cf. chapter 6, paragraph 6.4.

<sup>79</sup> Newer studies such as that of KIRSTEN & VINK (1999) show that the agricultural economy and the economy as a whole have benefited from liberalisation. Total factor productivity grew at a rate that was high enough to cause a substantial increase in the rate of growth of net farm income. However, not all farmers benefited equally from these changes.

promote the economy as well as the liberalisation of markets should always be borne in mind.

### **8.3 Public services in agriculture**

One of the most difficult tasks after the dissolution of several public institutions in the agricultural sector will be the implementation of a new, efficient service system for agriculture. Liberalisation has resulted in the creation of large deficits in agricultural research and development and stagnation in the development of new production methods. Likewise, there is a need for statistics, market research, an advisory board as well as training and business development in agriculture. These services must not necessarily be provided by the state. However, the state can make itself available to improve the competitiveness of the agricultural sector. In traditional literature certain aspects such as training and research are seen as the responsibility of the state (HENRICHSMEYER & WITZKE 1994).

Although certain policies envisage that the private sector take over the responsibility for these tasks, this will be very difficult because there are no organisational structures in the agricultural sector. In many countries a similar private or semi-public service system is financed by a system of fees and duties. At present it would not be possible to tax farmers for agricultural “common services” in South Africa. In all probability the administrative cost would exceed the benefit by far. This is why the private sector will remain very hesitant (VAN ROOYEN 1999).

In this regard, the South African government should become increasingly active. Research, training and advice will have a profound impact on the future competitiveness of agriculture.<sup>80</sup> South Africa should not carelessly give up the competitive advantage in production that it has over other African states. Public service industries such as advisory boards and market research organisations should initially be financed by a government fund although the source of funds should eventually become fees and duties.

Under the Marketing Act five commodity organisations have been granted the right to raise statutory levies to fund information, research and training. In addition, there are a number of ‘industry trusts’ that have public funds available for these functions as well as

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<sup>80</sup> Policies relating to research, education and technology can be seen as independent spheres in which legal and institutional frameworks can be created with a view to reaching stated developmental

reconstruction within the land reform programme. Such arrangements should be expanded to cover all commodities, and benefits should be available for the agricultural sector as a whole. The state should coordinate and increasingly support these efforts.<sup>81</sup>

It remains to be seen whether the government is fully aware of the importance of the commercial agricultural sector for South Africa and whether it will in future concern itself more strongly with the negative effects of liberalisation or whether it will only take action once a dramatic loss of jobs has occurred.

#### **8.4 Does the land reform programme correspond with policy objectives?**

The focal point of current agricultural policy is the subsistence sector, where there is a great need for development. The government sees potential in small-scale black farming for economic growth and employment in South African agriculture. The Land Reform Programme (LRP) has been implemented to increase access to agricultural resources of poor households in order to achieve economic growth (RSA 1996, 1997).

After five years of intensive state efforts, the results of the LRP have been rather modest. The high aims in terms of the quantity of land transfers to disadvantaged communities have not been achieved as yet. KIRSTEN & VAN ZYL (1998) estimated that a total 0,825% of farmland has been distributed to disadvantaged South Africans through a range of land reform models. The future competitiveness of post-land reform agricultural projects is more than questionable and the co-ordination of government and NGO activities leaves much to be desired (RSA and EUROPEAN COMMISSION 1997).

At issue is whether it is possible for the beneficiaries of land reform to earn income from agriculture in the long run and whether these small-scale farmers can make the necessary contribution to growth in the agricultural sector. Considering the results so far, it is clear that the beneficiaries of the programme probably do not meet the requirements for a sustainable small-scale agriculture and probably do not intend to remain farmers. Their ability to access resources is limited by the tiny government grants to such an extent that the land can at best meet some housing needs, whereas subsistence agriculture usually only

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objectives (Chapter 6). More importantly, however, they determine the provision of the relevant public goods.

<sup>81</sup> The financing of "common services" could take place by the integration of funds which are financed by levies. The most convenient forms of levies can be imposed at the bottlenecks of agricultural production such as abattoirs and sugar mills. A small part of the payments would be kept back and directed towards the fund. In this way the majority of the farmers could be levied fairly and easily.

comes in second place and is seldom possible. This is also revealed by the high urban share of the land claims. Only 16% of the land claims lodged by the end of the deadline of May 1998 were related to farm land (RSA 1998). The foundations for a lasting owner-operated small-scale agriculture can hardly be laid by the LRP in its present form. It rather promotes collectivisation in agriculture, which has had only doubtful success and doesn't make the individual better off.

In the future the government should carefully examine whether its programmes correspond with its policy objectives. Social welfare programmes should be declared as such and should be conducted with the relevant budget. If the situation in agriculture in disadvantaged areas is to be improved, the selection of programme beneficiaries should be more closely aligned with the objectives of agricultural policies so that the most efficient possible use of public means can be achieved.

When use is made of extensive public means, the government should act rationally, bearing in mind the objectives. This means that the current state of events as well as future opportunities must be evaluated rationally – political ideology or pipe dreams must not be the basis of state actions.

### **8.5 Need for policy corrections**

It is only right for the government to aim at increasing the wealth of the previously disadvantaged black community. The removal of racist legislation has been at the forefront of legislative activities. In the domain of agriculture the reform of statutes relating to the acquisition and tenancy of land as well as the Marketing Acts were milestones, since they form the basis of private ownership and use of land by formerly disadvantaged majority. Already market transactions of agricultural resources have a much greater scope<sup>82</sup> and effect on the creation of new agricultural livelihoods and jobs than the LRP, and it must be noted that this has been achieved without state aid.

The government should focus more on the market mechanism in the quest for a more efficient distribution of agricultural resources. The role of the government is to create a framework for a functioning market, to lower the risks involved in investing in agriculture

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This model is not equally suitable for all types of agriculture; rent seeking is never totally unavoidable.

<sup>82</sup> KIRSTEN & VAN ZYL (1998) estimate that a total of 0.825% of farm land has so far been redistributed to disadvantaged South Africans through a range of land reform models, but only the smallest part (0,225%) was a result of government programmes.





and to promote private involvement.<sup>83</sup> Transactions and investment in the agricultural sector should be the result of entrepreneurial actions rather than state means in order to ensure a future-oriented investment market.<sup>84</sup>

The amendment of the Land Act was a step in the right direction. Nevertheless the need for state intervention in the provision of public goods such as infrastructure, education and security still exists so that the institutional framework conditions of agriculture can be improved with a view to achieving the development objectives.

From this point of view the question arises whether state aid has a place in agriculture at all or whether it could not be implemented more efficiently elsewhere. If the government is really concerned with the promotion of black agriculture, there should be greater flexibility in the availability of means provided for by the LRP. Income should not be a selection criterion for beneficiaries. It would be preferable to consider the potential of the agricultural initiative in determining whether subsidies should be granted and how much the subsidies should be. Currently the maximum government grants per household are usually much too low to make sufficient land size of adequate quality available to provide at least a target income (KIRSTEN & VAN ZYL 1998). The provision of funds on a piecemeal basis as well as the application of dubious criteria inevitably results in a low degree of effectiveness. More suitable criteria for determining suitability should be the farm development plan/concept or the number of new jobs created. The concept of family farming must enjoy preference over large semi-state projects.

Only if existing black semi-commercial family farming enterprises in their different forms can expect to receive more public aid in future will the development of black agriculture be achieved and will a significant growth and employment contribution to small-scale agriculture be possible. The promotion of individuals without any or with only very limited agricultural expertise will most probably not assist in achieving these goals.

The government should only provide the framework within which the land reform process should take place and should not become the main player in the process. The traditional role of government in such processes is providing services such as infrastructure, markets and health care. This has not been given sufficient attention. The land reform process as such should also be left predominantly to market forces. A market-assisted reform is less costly and avoids superfluous bureaucratic efforts.

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<sup>83</sup> Cf. Chapter 6.

<sup>84</sup> Possibilities for market-orientated economic promotion are credits at low interest rates, investment allowances, suretyships and tax holidays.

Should it be impossible in the future to clearly define and distinguish the role which the public and the non-governmental sectors can and must play, it is doubtful whether the LRP as it is currently implemented has the ability to create the class of independent and viable small-scale family farms as initially envisaged. Otherwise a more diversified farm structure centred on competitive commercial, owner-operated family farms as envisioned by VAN ZYL (1996) will never become a reality.

## 8.6 Summary and results

The liberalisation of the South African agricultural market has led to extensive welfare increases. However, the commercial agricultural sector in the context of an economy influenced by the world market is only competitive to a limited extent. Future necessary adjustment processes will have a negative effect on the production of foodstuffs, the labour market and the rest of the economy. It is questionable whether, faced with the importance of commercial agriculture, suitable state subsidies should enjoy preference over a complete market liberalisation. Subsidies which conform with green-box requirements, similar to those that exist in other countries, could alleviate the crisis facing the commercial sector and ensure a maintained contribution of agriculture to the South African economy.

South African agriculture is reacting to market liberalisation in different ways. Agriculture in market-remote areas tends towards diversification and extensification. The current oversupply of cheap labour - and there is not much indication that this will change in the near future - favours large-scale agriculture dependent on hired labour in remote and market related areas as well. In conurban markets, where farms increasingly tend to shift to more high-value mixed farming that is often integrated with tourism and other service activities, there is a good chance for an expansion of family farming. But SA commercial agriculture as a whole is and will be dominated by large-scale farms dependent on hired labour in the near future as well. In the subsistence sector, there is no alternative to family farming and a commercialisation of those farms is only imaginable within the context of the family farming system.

There is a need for educational and technological policies as well as the creation of a legal and institutional framework that would make public goods available to agriculture. Greater involvement by the private sector is impeded by the liberalisation of the agricultural sector, which has resulted in the abolition of those organisational structures that could have assisted them. In this respect the state should become more involved in

order to achieve the objectives of development so that the productivity of domestic agriculture can be maintained in future.

The government's LRP has to date been characterised by mismanagement and lack of planning. The selection criteria for LRP benefits and the types and amounts of public aid complicate the efficient use of public means aimed at promoting and creating black small-scale agriculture. The means of the LRP should be available on a more flexible basis, namely taking the realistic potential of the agricultural initiative into account rather than considering the economic situation of individuals.

In order to improve efficiency in the allocation of agricultural resources, the government should rely more on the market mechanism to create the necessary framework conditions. An increased availability of public goods and a selective, goal-orientated promotion of semi-commercial, small-scale black agriculture would increase the effectiveness of state subsidies and would provide for a more realistic perspective for the development of agriculture towards small-scale family farms in the former homelands.

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## APPENDICES

### Appendix 1: Migration and commuter earnings compared with agricultural earnings in the former homelands, 1985

Territory	Total migrant and commuter earnings (R'1000)	Total agricultural earnings (R'1000)	%	Σ Household earnings (R'1000)	Number of households	Earning/ household R
Ciskei	449.625	19.564	4.2	469.189	199.146	2.356
Transkei	1588.423	163.700	9.3	1752.123	1.671.873	1.048
KwaZulu	3028.582	208.000	6.4	3236.582	990.993	3.266
Venda	205.790	26.241	11.3	232.031	155.621	1.491
Lebowa	1121.126	45.000	3.9	1166.126	679.561	1.716
Gazankulu	307.168	23.580	7.1	330.748	224.236	1.475
Bophutha-tswana	1671.247	52.400	3.0	1723.647	514.061	3.353
KaNgwane	382.180	17.600	4.4	399.780	1.18.138	3.384
KwaNdebele	361.651	2.300	0.6	363.951	99.849	3.645
QwaQwa	258.093	3.990	1.5	262.083	95.477	2.745
<b>Total</b>	<b>9373.886</b>	<b>562.645</b>	<b>5.7</b>	<b>9936.531</b>	<b>4.173.260</b>	<b>2.381</b>

Source: WORLD BANK, Southern African Department (1994).

### Appendix 2: Commercial farm debt in the RSA by creditors (in Millions of Rand)

Year	Land Bank		Com. Bank		Co-ops		ACB		Others		Total Loans
	Loans	Share	Loans	Share	Loans	Share	Loans	Share	Loans	Share	
	R	%	R	%	R	%	R	%	R	%	
1991	3.512	21	5.116	31	4.3	26	1.168	7	1.768	15	<b>16.686</b>
1990	3.441	22	4.95	31	3.78	24	1.013	6	2.68	17	<b>15.864</b>
1989	3.149	21	4.65	31	3.587	24	0.972	6	2.724	18	<b>15.082</b>
1988	2.924	22	3.478	26	3.412	25	0.921	7	2.778	20	<b>13.513</b>
1987	2.808	22	3.355	26	3.224	25	0.789	6	2.705	21	<b>12.881</b>
1986	2.649	21	3.437	28	3.081	25	0.684	6	2.562	20	<b>12.413</b>
1985	2.338	21	3.315	30	2.754	25	0.549	5	2.163	19	<b>11.119</b>
1984	1.923	20	2.969	31	2.234	24	0.443	5	1.927	20	<b>9.496</b>
1983	1.331	18	2.254	30	1.780	24	0.309	4	1.736	24	<b>7.410</b>
1982	0.989	17	1.600	28	1.368	24	0.247	4	1.583	27	<b>5.787</b>
1981	0.856	18	1.055	22	1.130	23	0.202	4	1.597	33	<b>4.840</b>
1980	0.676	18	0.802	21	0.867	23	0.180	5	1.315	33	<b>3.840</b>

Source: WORLD BANK, Southern African Department (1994).

**Appendix 3: Market involvement of rural households in the former homelands**

Crop	Market involvement in %			% of total production marketed %	Sales concentration % of total sales		
	Net buyers	No. net sales or buyer	Net sellers		50%	70%	80%
<b>KaNgwane (n=394)</b>							
Maize	68.7	7.4	23.9	62	2.8	7.4	11.2
Groundnuts	81.7	4.6	13.7	52	3.0	6.1	8.6
Dry beans	96.1	0.3	3.6	0.0	0.1	1.3	1.5
Yuco beans	95.9	0.0	4.1	66	1.0	1.8	2.5
<b>Kwa Zulu (n=193)</b>							
Maize	95.2	0.1	4.7	49	0.5	1.3	2.4
Beans	84.0	6.2	9.8	54	3.0	6.0	9.2
Potatoes	93.6	3.3	3.1	40	1.6	2.6	3.6

Source: VAN ZYL &amp; VAN ROOYEN (1990)

**Appendix 4: Economic performance of farms with different legal status**

Legal form of farm	Year				Change 94/95 over 91/92
	91/92	92/93	93/94	94/95	
<b>Profit per farm, in 1000 DM</b>					
Individual farms	64.4	66.9	74.1	70.6	9.6
Partnerships	179.3	293.3	193.4	174.9	-2.4
Coop./Corporat.	-322.1	-93.2	-82.7	-40.8	-87.3 <sup>3)</sup>
<b>Ratio of hired to total labor, in %</b>					
Individual farms	18.3	23.9	29.4	28.7	56.8
Partnerships	60.3	56.9	60.2	55.4	8.1
Coop./Corporat.	100.0	100.0	100.0	100.0	
<b>Annual wage per hired labor unit, in 1000 DM</b>					
Individual farms	23.8	27.5	28.9	29.7	25.0
Partnerships	30.2	32.0	34.2	38.6	27.5
Coop./Corporat.	27.7	30.6	35.5	35.8	29.1
<b>Profit plus wage per labor unit, in 1000 DM</b>					
Individual farms	40.2	40.6	43.1	41.3	2.9
Partnerships	54.9	75.9	55.8	55.5	1.1
Coop./Corporat.	22.6	28.0	31.5	34.9	54.3

Source: FROHBURG (1997)

**Appendix 5: The change in the agricultural labour force**

Date	Total employment 1000 pers.	Change in total employment		Part-time employees 1000 pers.
		to previous period	to 30.09.89	
30.09.1989	848.2			
31.12.1990	560.0	-34.0	-34.0	256.1
30.06.1991	400.0	-29.6	-52.8	234.8
31.12.1991	300.0	-25.0	-64.6	135.3
30.06.1992	190.0	-36.7	-77.6	32.4

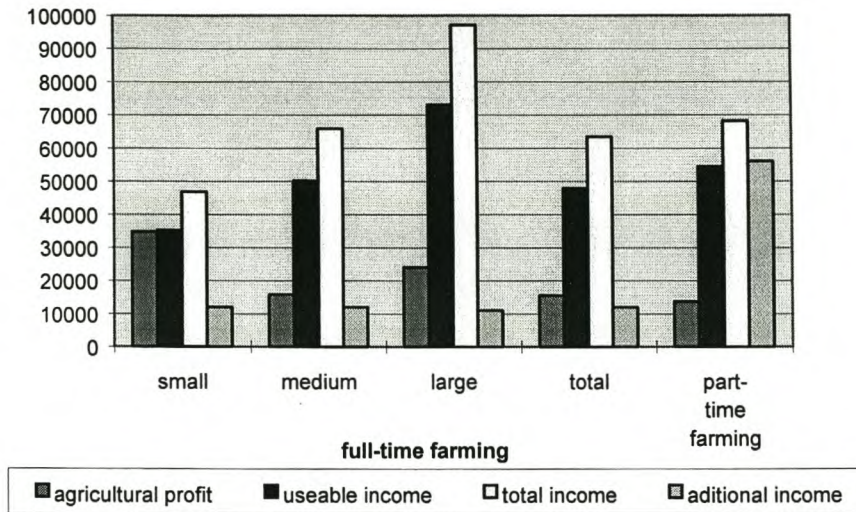
Source: SCHMITT (1993).

**Appendix 6: Change in Eastern German farm structure from 1992 to 1995**

Legal form	Year				Share in 1995	Annual change 1992-1995
	1992	1993	1994	1995		
	<b>Number of farms</b>				<b>%</b>	<b>%</b>
Individual farms	14602	20587	22505	24588	81.3	18.9
Partnerships	1123	1879	2379	2671	8.8	33.5
Cooperatives	1464	1388	1336	1315	4.3	-3.5
Corporate farms	1386	1514	1563	1674	5.5	6.5
<b>Total</b>	<b>18575</b>	<b>25368</b>	<b>27783</b>	<b>30248</b>	<b>100.0</b>	<b>17.6</b>
	<b>Utilised land in total, 1000 ha</b>				<b>%</b>	<b>%</b>
Individual farms	674.0	932.4	1081.7	1441.3	20.7	28.8
Partnerships	706.3	959.6	1116.4	1199.2	21.7	19.3
Cooperatives	2250.6	2053.7	1952.1	1887.4	34.2	-5.7
Corporate farms	1477.6	1351.0	1286.2	1292.7	23.4	-4.4
<b>Total</b>	<b>5108.6</b>	<b>5279.3</b>	<b>5436.4</b>	<b>5520.6</b>	<b>100.0</b>	<b>2.6</b>
	<b>Utilised land per farm, ha</b>					
Individual farms	46	45	48	46		0.0
Partnerships	626	511	469	469		-10.4
Cooperatives	1537	1480	1461	1435		-2.3
Corporate farms	1006	892	823	772		-8.4
<b>Total</b>	<b>275</b>	<b>209</b>	<b>196</b>	<b>183</b>		<b>-12.3</b>

Source: FROBERG (1997)

### Appendix 7: Total income and usable income of different German agricultural operations in DM per household



Source: Derived from BML (1998).

### Appendix 8: Wood and water collection for rural African households, by income group

	All rural Africans	Households ranked by groups of 20% (quintiles)				
		Quintile 1 (ultra-poor)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (richest 20%)
Share of households who need to fetch water daily	73,6	88,4	81,5	65	34,7	*
Distance to water source greater than 500 meters	21,1	23,5	20,9	13,6	*	*
Average amount of time per day spent fetching water (minutes)	189,5	189,5	199,5	176,7	*	*
Average amount of time per day spent fetching wood (minutes)	79,9	77,2	86,9	76,2	75,2	36,6

Note: \* The sample was too small to provide reliable information for these groups.

\*\* These averages refer only to people who fetch water and wood, respectively.

Source: WORLD BANK (1995)

**Appendix 9: Some characteristics of German and SA agriculture**

<b>Characteristics</b>	<b>Germany</b>	<b>SA</b>
GNP contribution	3%	>3%
<b>Farm data<sup>1</sup></b>		
Total number of farms	518.000	60.938
No. part-time farms	308.300 (59%)	NA
No. full-time farms	210.000 (41%)	NA
Average farm size	34,6ha	1350ha
<b>Land use patterns</b>		
Total area	31,5 Mil. ha	122 Mil. ha
Agricultural land	17,2 Mil. ha (54,6%)	99,1 Mil. ha (81%)
Arable land	11,8 Mil. ha	15,8 Mil. ha (13%)
Grazing land	5,1 Mil. ha	67,5 Mil. ha (55,2%)
Forest	10,7 Mil. ha (34%)	1,4 Mil. ha (1,1%)
Conservation land	-	11,7 Mil. ha (9,5%)
Other land	3,6 Mil. ha (11,4%)	
<b>Labour</b>		
Labourers in agriculture	1,32 Mil.	0.995 Mil.
Labourers per 1000 ha	76,7	14,3
Family labour	1,1 Mil.	65138
Hired labour	0,22 Mil.	0.93 Mil

Source: Derived from BML (1998) & SPIES (1996)

Notes: Commercial farms only in South Africa