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STRUCTURAL CHANGES AND EXPERIENCES WITH LAND REFORM IN GERMAN AGRICULTURE SINCE UNIFICATION

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Following unification of East and West Germany in 1990, the principal objective of the government was to restore previous property rights in the new federal states and to encourage competitive production structures. Institutions were quickly established to facilitate the required adjustments to a market economy. Privatisation of most firms (farms), which was an intricate and costly procedure, was accomplished within five years and resulted in a completely new farm structure in the new federal states. By 1996 over 80 percent of agricultural enterprises comprised private (individual) operations (cultivating 22 percent of land), 9,1 percent partnerships (22 percent of land), while about 3000 legal entities managed 56 percent of farm land. About 90 percent of farmland in the new states is being rented compared to 47 percent in the old states. Significantly, leasing and not selling became the most important method to privatise land in the new federal states. In 1996 the number of farming operations in Germany totalled about 540000. While worker employment in German agriculture is steadily decreasing, worker productivity is increasing - from 17 hectares of farm land per full-time equivalent worker (FTE) in 1991 to 43 hectares per FTE in the new states in 1996.

STRUKTURELE VERANDERINGE EN ERVARINGS MET GRONDHERVORMING IN DIE DUITSE LANDBOU SEDERT HERENIGING

Sedert hereniging van Oos- en Wes-Duitsland in 1990 was die hoofdoelwit van die regering om voormalige besitreg in die nuwe federale state te herstel en mededingende produksiestrukture aan te moedig. Instellings is gou tot stand gebring om die verlangde aanpassing by 'n mark ekonomie te bewerkstellig. Privatisering van die meeste firmas (plase), wat 'n ingewikkelde en duur prosedure was, is binne vyf jaar bereik en het gelei tot 'n algehele nuwe plaasstruktuur in die nuwe federale state. Teen 1996 het meer as 80 persent van die landbou-ondernemings bestaan uit private (individuele) ondernemings (wat 22 persent van die grond bewerk), 9,1 persent vennootskappe (22 persent van die grond), terwyl omtrent 3000 regspersone 56 persent van die landbougrond bestuur het. Omtrent 90 persent van die landbougrond in die nuwe state word gehuur teenoor 47 persent in die ou state. Dit is betekenisvol dat verhuring en nie verkoop nie die belangrikste metode vir

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grondprivatisering in die nuwe federale state geword het. In 1996 was die aantal landbou-ondernemings in Duitsland omtrent 540 000 in getal. Terwyl werkerindiensneming in die Duitse landbou stadig afneem, neem werkerproduktiwiteit toe - van 17 hektaar plaasgrond per voltydse ekwivalente werker (VTE) in 1991 tot 43 hektaar per VTE in die nuwe state in 1996.

1. INTRODUCTION

Germany experienced dramatic political and economic change at the end of the last decade when the former West Germany and East Germany were reunited, formally on 3 October 1990. The events leading up to unification were well documented in news reports, newspapers, magazines and journals. Germany now consists of 16 federal states (*Bundesländer*) of which five are new. Since the early 1990's billions of German Marks (DM) have been invested in the new federal states to improve the infrastructure (schools, roads, rail and communication systems) while private businesses have invested in new factories and other enterprises. The structure of agriculture in the five new states has also undergone considerable change.

The main objective of this article is to document major policy and structural changes as well as experiences with land reform in German agriculture since unification in 1990. The paper is structured as follows: The next section provides a brief comparison of statistics relating to German and South African agriculture. This is followed by an overview of economic and agricultural policy objectives in Germany, with particular reference to the new federal states. Section 4 provides an analysis of structural changes that have occurred in German agriculture since unification, particularly with regard to farmland, ownership of land and agricultural employment. The article concludes with a summary of the main findings.

2. COMPARISON OF GERMAN AND SOUTH AFRICAN AGRICULTURE

To place the discussion on policy and structural changes in Germany agriculture into perspective, a comparison of some important statistics between Germany and South Africa is presented in Table 1.

South Africa's population in 1996 was 37,9 million people (Central Statistics, 1997), which is less than one-half of Germany's approximately 82 million people. About 1,14 million people were employed on commercial farms in South Africa compared to 1,35 million employed (full- and part-time) on all farms in Germany. South Africa covers a land area of 122,3 million hectares which is 3,4 times the size of Germany (35,7 million hectares). Farm land comprises 82,4 percent of the area (of which about 16 percent is arable and 84 percent is grazing), conservation 9,6 percent (including

state parks, *etc.*), forestry 1,1 percent, and other land (urban areas, roads, *etc.*) 6,9 percent.

Table 1: Comparison of data between Germany and South Africa

Particulars	Germany	South Africa
Population (1996) (10 ⁶)	81,9	37,9
Total area (10 ⁶ hectares)	35,7	122,3
Agricultural land (10 ⁶ hectares)	17,3*	100,8
Arable land (10 ⁶ hectares)	11,8	15,9
Arable land/total agricultural land (percent)	68,2	15,8
Value of agricultural production (1995/96) (R10 ⁹)	165,1**	36,9
Agriculture's contribution to GDP (1996) (percent)	1,1	4,8
Number of farms (1996) (10 ³):		
< 50 hectares	466,4	1300+
> 50 hectares	73,4	58**
Employment in agriculture (1996) (10 ³):		
- full- and part-time	1350	1139+++
- FTEs	672	n/a

* Agricultural land utilised. Total agricultural land = 19,3 million hectares of which about 1,5 million hectares comprise private forests; the rest includes conservation and unusable land.

** Equivalent to DM61,373 billion. The exchange rate in 1995 and 1996 was R2,53 and R2,85 per DM, respectively.

+ estimate for 1991.

++ estimate for 1993

+++ estimate for 1993 (excludes people employed in developing agriculture).

n/a not available.

Sources: Central Statistics (1997); Directorate: Agricultural Statistics and Management Information (1998); Federal Statistical Office (1997); SA Reserve Bank (1998).

In Germany, agricultural land utilised comprises 48,5 percent of the total area, forests and conservation (including lakes, *etc.*) about 38 percent, and other land (urban areas, roads, *etc.*) 13,5 percent. Of the 100,8 million hectares of farmland in

South Africa, 86,3 million hectares (85,6 percent) are utilised for commercial farming and 14,5 million hectares (14,4 percent) are classified as developing agriculture (mainly in the former homelands). South African agriculture is thus characterised by a dual nature - commercial farming on one hand and small-scale (developing) agriculture on the other.

It is generally recognised that South Africa is a semi-arid country with relatively poor agricultural resources. Of the 100,8 million hectares of agricultural land only about 16 percent is arable while the remainder is suitable for extensive grazing only. In Germany, over two-thirds of agricultural land is cultivated. Based on gross value of production in the 1995/96 and 1996/97 seasons, maize grain, broilers, beef, vegetables (including potatoes) and deciduous fruit were the five most important enterprises in South African agriculture (Directorate: Agricultural Statistics and Management Information, 1998: 85). In Germany, the five main agricultural products include milk, pigmeat, beef, grains and vegetables (including potatoes) (Federal Statistical Office, 1997: 161). Although agriculture directly accounts for less than five percent of South Africa's GDP, and in Germany about one percent of its GDP, its contribution to the economy is considerably greater through its forward and backward linkages to other sectors of the economy (agribusiness).

The classification of commercial farmers is different in South Africa compared to Germany. Whereas in Germany the number of agricultural enterprises (540 000 in 1996) include operations as small as one hectare, in South Africa only *bona fide* (full-time) farmers are included in the number of commercial farming units. In 1993 there were an estimated 58000 commercial farming units in South Africa (Central Statistics, 1997), compared to about 117000 in 1950 (Directorate: Agricultural Economic Trends, 1995). The estimated Gross Domestic Product (GDP) of Germany in 1996 was DM3 541 billion (about R10 092 billion) compared to South Africa's R484 billion at factor cost (Directorate: Agricultural Statistics and Management Information, 1998; Federal Statistical Office, 1997).

3. GERMAN ECONOMIC AND AGRICULTURAL POLICY OBJECTIVES

Buchholz (1996) provides an excellent overview of German economic and agricultural policy objectives, and economic developments after unification. The following discussion summarises the main points of his paper. The overall economic policy objectives in Germany are based on the concept of a 'social market economy' which is characterised by a liberal economic order with private property, freedom of contract, liability, free entry and market competition as constituent principles,

complemented by social policy measures. The central objectives of the macroeconomic policy include economic growth, full employment, monetary stability and balanced foreign trade. Unification with East Germany, which occurred officially on 3 October 1990, did not change this basic orientation of economic policy.

Agricultural policy objectives, which were stipulated in the German Agricultural Law of 1955 and in the Rome Treaty of the European Economic Community of 1958, encompass two basic elements, namely, (1) participation of agriculture in economic development, and (2) securing food availability for the population. Interestingly, specific agricultural policy objectives for the former East Germany were not clearly defined. Implicitly, however, the principle objectives seem to have been (1) to restore previous property rights, and (2) to reorganise farm enterprises to facilitate competitive production structures over the long term. This involved other complementary objectives such as improving rural infrastructure, creating off-farm employment, encouraging environmentally sound production methods, and alleviating the social consequences of the adjustment process. Müller (1996:666) maintains that, after unification, the establishment of private family farms became the main political goal because of experiences gained in the old federal states, *i.e.*, these farms fitted easily into the existing legal and policy framework. He adds that the emphasis on the establishment of private family farms was not reflected in specific new regulatory laws but in the adaptation of existing ones and the proper organisation of privatisation.

German unification came unexpectedly and for political reasons had to be completed quickly. In July 1990, an economic, monetary and social union was concluded by the two states. The details of unification were specified in a unification treaty and official unification was achieved on 3 October 1990. The constitution of the former West Germany was extended to the new federal states.

Reversing a socialistic economy to a market economy was a major challenge for the German government. Significantly, privatisation of property was initiated by the last East German government which passed the Trusteeship Law (*Treuhandgesetz*) in June 1990, followed by the formation of a Trustee Agency (*Treuhandanstalt*). The tasks of the Trustee Agency were to (1) return the state-owned and state-operated enterprises to private ownership, (2) support restructuring of enterprises to enable them to compete in the market, (3) close down enterprises where reorganisation could not be achieved, and (4) redistribute state-owned land. Despite many difficulties, the tasks were almost completed within five years and the Trustee Agency was dissolved at the end of 1994 (its tasks have now been taken over by the

Federal Agency for Special Tasks Associated with Unification). Initially, the Trustee Agency possessed more than 12 000 firms and 40 000 factories. By the end of 1994, more than two-thirds of these had been privatised and 30 percent had been liquidated. Privatisation was an intricate and costly procedure: Total expenditure of the Trustee Agency amounted to DM337 billion whereas receipts from the sale of firms totalled DM73 billion. The deficit had to be financed with public funds (Buchholz, 1996).

Müller (1996) points out that the need for properly organising the privatisation of land, and the fact that the complex and often controversial activities involved should be undertaken as far as possible independently of the government, led to the establishment in April 1992 of the BVVG (*Bodenverwertungs- und verwaltungsgesellschaft mbH*, or the Land Utilisation and Administration Company Ltd), which was responsible for the privatisation (selling and leasing) of land for agricultural, forestry and other purposes. Shareholders in this company were the Trustee Agency and three banks.

The transformation of the economic and political system in the new federal states did not only have its advantages, such as financial support and transfer of human and technological capital from the former West Germany, but also its drawbacks. Rapid change put the economy of the new states under severe stress. The resulting changes in relative prices, wages and exchange rates fully exposed the deficiencies of the East German industries (*i.e.*, high-cost production, inferior product quality and 'overemployment'). Since the East German economy was in a poor state, the rapid transformation devalued all assets and made the transformation more expensive than was initially expected. Trade relations with former partners in the eastern trading block (COMECON) also broke down (Buchholz, 1996).

Another important aspect of the rapid takeover of institutions and methods of management meant that the knowledge and skills of East German 'experts' effectively became useless. Many leadership positions were taken over by West Germans, a change which was not always welcomed and caused dissatisfaction. Production and employment were also severely affected by the transformation. For example, during 1991 and 1992, the first two years after unification, total production in the new federal states decreased by about 20 percent and industrial production by 46 percent (Buchholz, 1996). This was accompanied by a dramatic drop in employment, from 5,5 million in 1990 to about 2,6 million in 1991, *i.e.*, by over 50 percent. The unemployment figure of 913 000 in 1991 would have been much higher had it not been for early retirement, job retraining and other labour market

programmes. It soon became apparent that the cost of adjusting to a market economy was substantially higher than at first anticipated.

Buchholz (1996) provides data which show that public financial transfers amounted to DM151 billion in 1992, DM162,4 billion in 1993, DM165,6 billion in 1994 and DM195,5 billion in 1995. About 40 percent of the total payments were spent on labour market and other social programmes, about 35 percent for infrastructure and investment purposes, and 25 percent served to finance the necessary changes in organisation and administration. Despite the difficulties that have been experienced, the economy of the new federal states is growing and exports are rising; for example, in 1994 real GDP was about nine percent higher than in the previous year. The significant growth in production and exports indicates that the competitive disadvantages of industries in the new states are gradually declining. However, compared to the old federal states, most of the economic indicators are still unfavourable, except for gross investment. Although there has been a slight increase in employment, the rate of unemployment in the new states is still much higher than in the old states (16,7 percent compared to 10,1 percent in 1996 (Federal Statistical Office, 1997: 123-124)). Disposable income in 1996 was about 70 percent of the level in the old states (up from 47 percent in 1991) and productivity close to 60 percent (up from 31 percent in 1991). It could still take many years (or even decades) before the objective of equality in living standards is attained.

With regard to agricultural policies, the transition followed a similar pattern as in the rest of the economy. Policies that were applied to West German agriculture, including the relevant European Union (EU) policies, also became effective for the new federal states. These policies were, however, complemented with newly-established policies that were designed to enhance the transition to a market economy. These included (1) the Agricultural Adjustment Law (*Landwirtschafts-anpassungsgesetz*) designed to facilitate the transformation of the former production co-operatives or LPG's (*Landwirtschaftliche Produktionsgenossenschaften*); (2) regulations for the privatisation of former state farms or VEGs (*Volkseigene Güter*); (3) transitional regulations for introducing EU market orders; (4) a programme to aid liquidation of production co-operatives; (5) specific support for farms in the new states in the context of the co-operation programme; (6) measures to support market structure; (7) regulation of old debts; and (8) transitional regulations for social policies applicable to agriculture (Buchholz, 1996). The total cost of these programmes in the period 1990 to 1995 amounted to DM17,4 billion (more than DM4 billion annually in 1990 and 1991; this had decreased to less than DM2 billion annually in 1994 and 1995 and will be decreased further in future). Müller (1996)

points out that, contrary to the initial goals and expectations, leasing and not selling became the most important method of privatising land. He further describes the method used in, and experiences gained from, this initiative.

4. STRUCTURAL CHANGES IN GERMAN AGRICULTURE

The overriding objective of central planning authorities in the former East Germany was to maximise agricultural production in order to maintain self-sufficiency in food production, which was actually achieved. Following unification, fixed prices for agricultural products were abolished and, according to Buchholz (1996), product prices fell to the lower price levels in the former West Germany. Using a 1:1 exchange rate between the East and West German marks (the real exchange rate was about 4:1), prices for crops fell by 25-50 percent and for livestock by 60-70 percent. Furthermore, competition from West German products led to a sharp drop in sales of East German products. Input prices decreased as well (except for items such as building, machinery and hired labour costs) but not to the same extent as product prices so that the product/input price ratio deteriorated. Significantly, the cost of hired labour more than doubled.

During the last stages of central planning in the former East Germany, livestock production became highly concentrated in very large production units. After unification, livestock production in the new federal states decreased dramatically. For example, in the period 1990 to 1994, production of beef decreased by 36 percent, pork by 66 percent, mutton and lamb by 55 percent, poultry by 41 percent, milk by 36 percent and eggs by 54 percent (Buchholz, 1996). Economic factors dominated this trend: Relative prices for livestock decreased substantially, hired labour costs (on large farms) increased considerably, newly-established private farms seldom engaged in livestock production because of limited labour capacities (livestock production being relatively labour-intensive) and limited capital to start production, and many operations were shut down owing to capital shortages (either for costly repairs to run-down buildings and machinery, or for construction of new buildings). Strict environmental regulations also forced the closure or reduction in size of many large livestock production units. The sharp decline in livestock production, which was not foreseen, resulted in considerable overcapacities in the processing industry.

Crop production, on the other hand, benefited from access to modern production technologies and from unrestricted availability of appropriate production inputs. Restricting influences included lower product prices, EU market regulations, CAP reform and participation in land set-aside programmes. Nevertheless, yields of

various crops increased and are now comparable with those in the west (on similar soils). The main crops include grains (with less wheat and more rye than in the west), sugar beet and oilseeds (from 1989 to 1994 production of grains and oilseeds increased, while sugar beet and potato production decreased - potatoes by over 80 percent (Noleppa, 1996)). The production area shows a larger proportion of arable land and a lower proportion of pastures and grassland than in the old federal states. This is not expected to change with the decreasing livestock numbers. Fallow land is higher than in the west because the larger farms participate fully in the land set-aside programme. Forecasts for the year 2000 point to production surpluses for all main field crops relative to regional demand which indicates an improving competitiveness of crop production in the new states (Buchholz, 1996).

4.1 Number, size and ownership of farm businesses

According to the general privatisation strategies, farm land (and other property) was returned to its former owners, sold or rented out. Previous land owners could reclaim their old property, except those who were expropriated between 1945 and 1949 (for an historical overview of land reform in Germany, see Weber (1991)). Members of the LPG's (production co-operatives), for example, had the opportunity to take their land and assets out of the co-operative. The LPG's had to change their judicial status to a co-operative based on West German law (*Genossenschaftsgesetz*). The land of the VEGs (former state farms) was acquired by the Trustee Agency and privatised (usually to a private company). König and Isermeyer (1996) analysed the transformation of these enterprises to the status of natural and legal persons (entities) in the period 1 January 1990 to 1 January 1994. Transformation followed an S-shaped curve, as in the adoption of a new technology (Girlishness, 1957). By 1992 the majority of enterprises had been privatised. Those that could not be privatised in the stipulated time were liquidated, which involved about 20 percent of LPGs.

These developments resulted in a completely new farm structure in the new federal states. For example, according to Buchholz (1996), the total number of farms in East Germany until 1989 consisted of 4530 production co-operatives (LPGs), 580 state farms (VEGs) and about 3600 other smaller and privately-owned farming operations (the BMELF (1997: 14) refers to 4650 large co-operative- and state-run enterprises). About 25 percent of the 5,6 million hectares of agricultural land was state-owned. In 1996 there were 30843 farms of quite different legal forms, the main distinction being that of natural persons and legal entities (Table 2).

Table 2: Types of agricultural enterprises in the new federal states, Germany, 1996

Legal status	Enterprises		Agricultural area		Ha per enterprise
	Number	Percent of total	1000 ha	Percent of total	
Natural persons	27 834	90,2	2 438	43,9	88
- private farms	25 014	81,1	1 205	21,7	48
- partnerships	2 820	9,1	1 233	22,2	437
Legal entities	3 009	9,8	3 118	56,1	1 036
- co-operatives	1 293	4,2	1 843	33,2	1 425
- private companies	1 432	4,6	1 183	21,3	826
- public companies	54	0,2	74	1,3	1 369
- other	230	0,8	18	0,3	78
Total	30 843	100	5 556	100	180

Source: MELF (1997:15)

Private (individual) operations comprise over 80 percent of all agricultural enterprises but operate only about 22 percent of farmland, averaging 48 hectares per farm. Partnerships comprise 9,1 percent of all operations but also farm about 22 percent of agricultural land, and average 437 hectares per enterprise. The legal entities (co-operatives, and private and public companies) operate about 56 percent of all land and average over 1 000 hectares per entity. The farm structure that has emerged in the new states is also quite different from that of the old federal states. A comparison of the distribution of farm sizes in the old and new states in 1991 and 1996 is presented in Table 3.

In 1996, 17,3 million hectares were utilised for agricultural production in Germany, 11,7 million hectares in the old federal states and 5,6 million hectares in the five new states (BMELF, 1997:10). These areas were operated by about 540 000 agricultural enterprises with more than one hectare of agricultural land. Of these enterprises, 30 843 were located in the new states and 509 132 in the old states. In general, over 97 percent of the enterprises were privately owned by individuals, 1,8 percent by partnerships (*e.g.*, father-son arrangements) and one percent was controlled by legal entities (including co-operatives, private and public companies, research farms, church enterprises, *etc.*). Partnerships and legal entities are particularly prevalent in the new states where they comprised close to 20 percent of all enterprises and operated nearly 80 percent of agricultural land in 1996 (Table 2). Although the overall number of farm businesses decreased on average by 2,6 percent per year since 1991, they increased by over 10 percent per year in the new states as a result of

privatisation. From 1995 to 1996 this increase had slowed down to two percent.

Table 3: Distribution of farm sizes in Germany, 1991 and 1996

	Old federal states			New federal states			Germany		
	1991	1996	Annual change	1991	1996	Annual change	1991	1996	Annual change
Farm size (ha)	No. of farms (1000)		Percent	No. of farms (1000)		Percent	No. of farms (1000)		Percent
1-10	275,1	228,1	-3,7	9,5	13,6	7,4	284,6	241,7	-3,2
10-50	272,5	217,8	-4,4	4,0	6,9	11,5	276,5	224,7	-4,1
50-100	43,3	50,1	3,0	1,1	2,3	15,9	44,4	52,4	3,4
> 100	7,9	13,0	10,5	4,0	8,0	14,9	11,9	21,0	12,0
Total	598,8	509,1	-3,2	18,6	30,8	10,6	617,4	539,9	-2,6

Source: Adapted from BMELF (1993:10; 1997:11)

In the old federal states the number of farms with more than one hectare of land decreased by 15 percent in the period 1991 to 1996, or by 3,2 percent per year. This trend has accelerated over time; for example, from 1981 to 1985 the annual decrease in the number of farms averaged 2,0 percent, while in the period 1985 to 1990 the mean annual decrease was 2,5 percent (BMELF, 1997: 11). Average farm sizes are, therefore, increasing. In the old federal states the overall farm size averaged about 23 hectares in 1996 compared to 19,5 hectares in 1991 and 17 hectares in 1985. This is evident in Table 3 where the number of farms larger than 50 hectares has increased over time while the number of farms smaller than 50 hectares has decreased. In 1995, about 42 percent (1991: 44 percent) of private farms were operated on a full-time basis (mean of 38,7 hectares) and the remainder on a part-time basis (mean of 8,8 hectares). About 62 percent of agricultural enterprises in the old federal states rented land in 1995. Rented land, which averaged 16,5 hectares in 1995 compared to 9,4 hectares in 1985, represented 47 percent of all agricultural land in the old states in 1995 (BMELF, 1997: 14).

The restructuring of agricultural enterprises in the new federal states is continuing (Table 3). Since 1991 more private (individual) businesses and partnerships have evolved, while the number of companies and co-operatives has decreased. Importantly, out of the approximately 5000 co-operative- and state-run enterprises that existed in the former East Germany, about 18600 agricultural enterprises had

emerged by 1992, and this had increased further to 30843 in 1996 (BMELF, 1997: 14). In particular, individual businesses now comprise over 80 percent of all agricultural enterprises (operating about 22 percent of agricultural land). The number of partnerships has doubled since 1991 and the 2820 partnerships in 1996 also operated about 22 percent of agricultural land. Although the total number of legal entities has not changed much since 1991, the number of co-operatives and public companies has decreased and the number of private companies has risen (BMELF, 1995; 1997). Nevertheless, the approximately 3000 entities in 1996 operated 56 percent of all agricultural land compared to 91,4 percent in 1991. The average area operated differs appreciably between the various legal structures (Table 2). At present, the overall farm size in the new federal states of about 180 hectares is significantly larger than in the old federal states (23 hectares). However, while the number of farms in the new states is increasing with greater individualisation of enterprises, the number of farms in the old states is decreasing and the average size is increasing as these businesses adjust to the changing economic environment (see, for example, Weiss, 1996; Zimmermann and Zeddies, 1996).

In 1995, about 28 percent of *individual businesses* in the new states operated on a *full-time* basis and, with an average of 122,6 hectares, the farms were significantly larger than in the old federal states (38,7 hectares). *Part-time* businesses operated an average of 15 hectares (compared to 8,8 hectares in the old states). Rented land accounted for 90 percent of all agricultural land (269 hectares per business), much higher than in the old states (47 percent) (BMELF, 1997:14). In 1995, 2,2 percent of enterprises in the old states operated more than 100 hectares and 15,5 percent of all farm land, whereas in the new states 24,2 percent of enterprises exceeded 100 hectares and accounted for 93,5 percent of all farm land in that region. Clearly, agricultural businesses in the new states are considerably larger than in the old federal states. This situation may continue in the long term as small enterprises are under increasing pressure from deregulating markets to expand their size of operation to exploit economies of size. However, Buchholz (1996) points to the debate among agricultural economists as to the future prospects of large farms, particularly the production co-operatives and limited stock companies. Some claim that co-operative farm operations are likely to fail as world-wide experience has suggested (and seems to prove a superiority of smaller family farms). Others argue that new developments in production methods and organisation, supported by modern information technology, may well lead to the viability of new farming structures irrespective of business size.

Consolidation of the farm structure in the new federal states has not been reached

yet. Buchholz (1996) attributes this to many different and complex problems all types of farm have to deal with, including, for example, high investment requirements (especially in farm buildings), difficulties in claiming or re-establishing property rights, problems in returning land and other assets to former members of co-operatives, insufficient equity and problems in credit procurement, and high levels of newly-incurred and old debts. The process of establishing new private farms has slowed down but continues. The number of legal entities seems to have reached its peak. It is, therefore, possible that the legal status of the larger enterprises will undergo further changes, especially when support programmes are reduced or terminated.

4.2 Renting of agricultural land

According to Müller (1996), leasing and not selling became the most important method to privatise land in the new states. By 1994/95, the BVVG had granted 14500 leasing contracts covering about 1,1 million hectares of *state-owned* agricultural land. The so-called 'new users' (*i.e.*, local farmers wishing to expand or start a new business) and 're-users' (*i.e.*, landowners dispossessed during the land reform of 1945-49 or later) were given the highest priority and accounted for 56 percent of the contracts and 35 percent of the land area allocated. Legal entities (second priority class) used 30 percent of the leases granted which covered 59 percent of the land area.

Doll & Klare (1996) analysed the land rental market in the new federal states and found that markets for rented farm land developed fastest near the former border between the two German states as well as for arable land located in favourable farming regions. A regression analysis based on data covering over 13000 lease contracts indicated that the natural productivity of arable land was the main determinant of land rents. In 1991, land rents per hectare in the new federal states averaged DM133 and these had increased to DM150 in 1993. In the old federal states, land rents averaged DM425 per hectare in both years. Land rents in this region appear to be stagnating at a relatively high level while they are rising in the new states as the rental market adjusts to changing economic factors. The significantly lower land rents in the new federal states has been attributed to the following factors (Doll & Klare, 1996): Adjustment problems associated with economic restructuring which cannot be solved in the short term; rental calculations based on total costs (with the establishment of new enterprises and operations) compared to marginal costing in the old federal states; greater competition for available rental land in the old states as farmers strive to increase business size; the greater proportion of own

land and employment of family labour in the old states which enables farmers to pay higher rentals, at least in the short term; a greater proportion of land in the new states with poor soils and/or unfavourable climatic conditions (drought risks); and a lower level of quotas, on average, for sugar beet and milk production in the new states. The difference in land rentals between the two regions is expected to decline over time as the variations in economic factors diminish and the rental market stabilises.

4.3 Agricultural employment

In the former East Germany employment in agriculture accounted for about 10 per cent of total employment in the economy, compared to 3,7 percent in West Germany. However, of the 850 000 people employed in agriculture, about 150 000 were involved in handicraft jobs or social work in the co-operatives and state farms (Buchholz, 1996). The changed economic environment following unification soon revealed substantial 'overemployment' in agriculture in the new federal states which could not be sustained economically. This resulted in a substantial decrease in agricultural employment - from 850 000 to about 300 000 at the end of 1991.

In 1996 about 1,35 million people were employed in German agriculture on a full- and part-time basis. This is 3,9 percent less than in 1995 (BMELF, 1997:8). In the old federal states, agriculture relies mainly on family workers employed largely on a part-time basis, whereas in the new states agricultural employment is characterised by full-time hired workers. However, the considerable structural differences in agricultural employment between the two regions have diminished over time. The number of family workers in the new states increased from about 39 500 in 1991 to 48 500 in 1996 (4,2 percent per year) whereas the number of hired workers decreased substantially from 321 000 to 103 600 over the same period (BMELF, 1993; 1997). The proportion of family workers thus increased from nine percent of all workers in 1991 to 30 percent in 1996. These structural changes may be attributed to the privatisation of agricultural enterprises in the new states, adoption of new technologies and the reduced transaction costs associated with family workers relative to hired workers (Beckmann, 1996; Schmitt, 1996).

To gain a better perspective of worker performance, the number of full-time equivalent workers (FTEs) were estimated. In 1991 there were 1,018 million FTEs employed in German agriculture (706 000 in the old federal states and 312 000 in the new states). This had decreased to about 672 000 FTEs in 1996 (546 000 in the old and 126 000 in the new states) (BMELF, 1993; 1997), a decrease of about 8 percent per

year. In the old states the number of FTEs in agriculture decreased by an average of 3,9 percent per year since 1970. In the new states the decrease since 1991 was due mainly to privatisation of enterprises and adoption of new technology (the most dramatic decrease occurred from 1991 to 1992 when the number of FTEs in the new states fell from 312 000 to about 174 000). Worker productivity in German agriculture has thus increased - from about 17 hectares of farm land per FTE in both regions in 1991 to about 22 (43) hectares per FTE in the old (new) states in 1996. A further significant decrease in agricultural employment is expected over the next 10 to 15 years (BMELF, 1997:10). König & Isermeyer (1996) point out that, in the new states, the substantial decrease of employment (of hired workers) on enterprises classified as legal entities significantly increased labour productivity in these operations, but that, on average, labour productivity is still lower than on private farms.

5. MAIN OUTCOMES OF TRANSFORMATION

Reversing a socialist economy to a market one was a major challenge for the German government after unification in 1990. The principal objective of the government was to restore previous property rights in the new federal states and to encourage competitive production structures over the longer term. This involved other complementary measures such as improving rural infrastructure, creating off-farm employment, encouraging environmentally sound production methods and alleviating the social impacts of the adjustment process. Establishing private family farms was a main political goal as these farms fitted easily into the existing (western) legal and policy framework.

Institutions were quickly established to facilitate the required adjustments to a market economy. Privatisation of most firms (farms), which was an intricate and costly procedure, was accomplished within five years. The rapid transformation of the economic and political system in the new states placed the economy under severe stress and the resulting changes in relative prices, wages and exchange rates fully exposed the deficiencies of the previous East German economy (*i.e.*, high-cost production, inferior product quality and 'overemployment'). Production and employment were severely affected by the transformation. Public financial transfers amounted to more than DM150 billion annually. The economy of the new federal states is now growing and exports are rising, indicating that the competitive disadvantages of the east German economy are declining. However, unemployment is higher and productivity is still lower than in the old federal states. It is expected that it could still take many years (or even decades) before equality in living

standards among people in the new and old federal states is attained.

These developments resulted in a completely new farm structure in the new states. Farmland (and other property) was returned to its former owners, sold or rented out. Members of the former production co-operatives (LPGs) had the opportunity to take their assets out of the LPGs which had to change their legal status to a co-operative under West German law. Former state farms (VEGs) were mainly converted to private companies. By 1996, over 80 percent of agricultural enterprises comprised private (individual) operations, but they cultivated only about 22 percent of farmland, averaging 48 hectares per farm. Partnerships (9,1 percent of enterprises) also operated 22 percent of farm land while about 3000 legal entities (co-operatives, private and public companies, *etc.*) operated about 56 percent of all land, averaging over 1000 hectares per unit.

Importantly, the number of private farms in the new states is rising, while the number of small farms in the old states is decreasing and the average size of the remaining farms is increasing as these farms adjust to a changing (deregulating) economic environment. At present, the average farm size in the new states of about 180 hectares is considerable larger than in the old states (23 hectares). Renting land plays an important role in German agriculture - in the old states 47 percent of all land is rented compared to 90 percent in the new states. Significantly, leasing and not selling became the most important method to privatise land in the new states.

The economic changes in the new federal states resulted in a substantial decrease in agricultural employment, and the trend is still continuing. In these states, agriculture relies mainly on hired workers employed on a full-time basis, whereas in the old states agricultural employment is characterised by part-time family workers. These structural differences in agricultural employment between the two regions have, however, diminished over time, with the number of family workers in the new states increasing and the number of hired workers decreasing. This may be attributed to the privatisation of agricultural enterprises, adoption of new technologies and the reduced transaction costs associated with family workers relative to hired workers.

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