

NAE Chapter 2B

Changes in the Organization of Agricultural and Food Systems

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References

Key messages:

1) There have been dramatic changes in the organization of agricultural and food systems since 1945. During a first sub-period (1945-1975), agriculture and food processing went through an industrialization process, which resulted in big production and productivity increases. During a second sub-period (since 1975) changes have focused on achieving quality rather than quantity and were more driven by consumer demand.

2) After WWII agricultural productivity increased significantly in both North America and Western Europe. The increased productivity of agriculture was supported by technological development and specific food supply oriented policies. The resulting increase in total food production answered problems of hunger and food shortages in Western Europe and the USA. These changes occurred in a context of continued peace and stability.

3) In Eastern Europe and Russia, the degree of food self-sufficiency increased from 1945 until to the 1960s, but from the 1960s to 1989 the former USSR started to import foods from Western Europe, the USA and Canada.

4) After 1989 a transition period occurred in some Eastern European countries which had experienced collectivization under the USSR. This period was characterized by falling food prices.

5) During the 1930s in the USA, and after WWII in Canada and Western European countries, farm policies were adopted and implemented in order to improve farm income, promote the adoption of technological innovation and to sustain increases in agricultural productivity. These farm policies were mainly characterized by programs of price support or price stabilization at the farm gate, or by supply management programs. In terms of increasing productivity and total production, these policies were largely successful. They also contributed to improving average farm income, to alleviating poverty in farm populations in regions like South Italy, Ireland, Wales, Northern Ireland, Scotland, Spain, Greece and Portugal, and contributed to the economic development of these countries. But by the mid 1960's these farm policies started to generate surpluses of farm commodities and the disposal of these surpluses distorted international trade. At the same time, rural areas experienced drastic decreases in the number of farms and farm workers (resulting in rural exodus). In addition, the modernization and intensification of agriculture that was promoted by these policies had, during the last two decades in particular, damaging environmental and social consequences.

6) The increase in agricultural productivity has led to a decrease of real prices for agricultural products in North America and Europe (NAE) over the last 40 years. NAE

1 has become an enormous export and import market that affects agriculture and
2 consumers in the rest of the world.

3
4 **7) The decrease in real price and the increased availability of food has led to better**
5 **affordability of food and better nutrition for the majority of the NAE population.**

6
7 **8) The increase in food supply in NAE has progressively led to general abundance**
8 **followed by quantitative saturation (in the amount of food calories available).** This has
9 had drawbacks as regards to nutrition and health. Over the last 15 years, the development of
10 nutrition-related chronic diseases, not least of which is obesity, in all parts of the region, and
11 in Eastern Europe, has had a heavy economic, public and social cost.

12
13 **9) The combination of the decrease in real food prices and the increase of personal**
14 **income in NAE countries have led to a decreasing share of household expenditures**
15 **devoted to food.** Falls in the real prices for agricultural products has led to the development
16 of the food service/ catering sector and to an increased sophistication of the market for food.
17 These developments have been concurrent with an increasing demand for variety, including
18 higher demand for quality foods, organic foods, fair trade, animal-friendly production and
19 ethnic foods.

20
21 **10) The structure of the food system has changed over time in NAE and the main**
22 **emerging trends are the following: horizontal and vertical integration of the whole food**
23 **industry; the growing influence of large retailers on food supplies; the increased**
24 **influence of large scale catering/ food service businesses.**

25
26 **11) From the 1980s onwards new societal demands in Western Europe called for a**
27 **more multifunctional agriculture that emerged on the political agenda.** Multifunctionality
28 implied that agriculture should now deliver not only food but also services that met emerging
29 social demands such as: environmental protection, (including the management of resources
30 such as water and land, landscape, biodiversity, and natural habitat); environmentally-friendly
31 production of food; use of land for residential needs and recreational activities; protection of
32 local cultures and knowledge; protection of cultural heritage through the production of
33 traditional foods; ethical dimensions of food production such as positive contributions to food
34 security and social justice (such as fair trade); and animal welfare considerations.

2B.1 Changes in farm structure, agricultural markets and support services

2B.1.1 Farm policies and the development of NAE agricultures

Farm policies have played a major role in the transformation of the agricultural sectors in Western Countries during the last six decades and clearly contributed to the rapid adoption of new technologies and to in dramatic increases in output and productivity.

The cases of US and EU Farm Policies will be used below to illustrate the importance of their role. The agricultural legislation and policies of most Western countries during the past fifty years have had two underlying themes. One is to provide farm families with incomes equivalent to those in other segments of society; the second in to ensure an adequate and safe food supply for all the people in the country. To these ends a complex combination of measures has been produced, which at one end of the spectrum has tried to keep small farmers on the land and at the other has encouraged the consolidation of holdings into efficient mechanized units. Quotas and tariffs barriers have been used to protect local production from foreign competition. Price supports, production subsidies, and supply controls have all been used to raise minimum family incomes while meeting some government budget constraints. (Stanton)

US Farm Policy: a legacy of the Great Depression

The US farm policies implemented after WWII were actually designed and tried during the Great Depression. As part of the Great Depression, the farm depression with the falling prices of agricultural products gripped all the rural areas, prompting the Federal Government to intervene into agricultural markets to support farmers' incomes, stabilize prices and guarantee cheap food to low income populations. The most important instruments were production controls and government loans.

The demands of agriculture for an equal share of prosperity were swept up in a much broader package of direct Federal interventions as the economy at large faltered at the end of the 1920's. Beginning with Franklin Roosevelt's New Deal in 1933, the solution to rapidly falling farm incomes was primarily price supports, achieved through dramatic reductions in supply. Supply controls for staple commodities included payments for reduced planting and government storage of market-depressing surpluses when prices fell below a predetermined level. For perishable commodities such as milk and some specialty crops, supply control worked through a system of marketing orders that provided negative incentives for producing beyond specified levels. As parts of the farm programs were the beginnings of later food programs: food stamps, commodity foods and school lunch programs. The combination of price supports and supply management functioned as the essential outline of Federal farm policy from 1933 until 2007, and continues to figure in current debate, although the mechanisms and relative weights of the policies' components were modified by successive farm legislation. In some years, notably during World War II and postwar reconstruction, and

again during the early 1970's and mid-1990's, global supplies tightened sharply, sending demand and prices soaring above farm price supports and rendering acreage reduction programs unnecessary. But for most of the period, repeated cycles of above-average production and/or reduced global demand put downward pressure on prices, keeping the programs popular and well funded. Continued public support for direct intervention after World War II arose for different reasons. Low prices and consequent low farm incomes of the 1920's and early 1930's had been the result of surpluses created by sharply reduced global and domestic demand, beginning with Europe's return to normal production after World War I and followed by the international economic depression of the 1930's. Surpluses in years following World War II resulted from rapidly increasing productivity, exacerbated by continuing high price supports that kept production above demand. The apparent success of production controls and price supports in raising and maintaining farm incomes by the mid-1930's, however, made a continuation of these policies publicly acceptable. Nonetheless, intense debate between proponents of high price supports and those who believed farm prices should be allowed to fluctuate according to market demand continued from the mid-1950s to the mid-1960s. The debate was set in the context of large surpluses, low prices, and efforts led by the Eisenhower administration to return the U.S. economy and government bureaucracy to pre-New Deal, pre-World War II structures. Out of the debate—between advocates of very high price supports and mandatory production controls and those who wished to end direct government market intervention—came a compromise for farm policy. The Food and Agriculture Act of 1965 made most production controls voluntary and set price supports in relation to world market prices, abandoning the “parity” levels intended to support farm income at levels comparable to the high levels achieved during the 1910's. A system of direct income support (“deficiency”) payments compensated farmers for lower support prices. Some exports programs at concessional prices and food aid programs (PL 480) were implemented during the 1950's and 1960's in addition on programs already in place to promote exportations in order to deal with a part of excess output. The debate over price supports and supply control recurred with enough intensity to divert the direction of policy in the mid-1980's. The new setting was the farm financial crisis and its aftermath, along with efforts by the Reagan presidency to end “big government” and place the American farm economy on a free-market footing. This time, with steadily increasing government stocks of program commodities and Federal budget deficits at record levels, the argument against continuing expensive government support of the farm economy gained support. At the same time, the farm crisis began to undermine some of the farm sector's confidence that domestic price supports and production controls were a very effective way to secure U.S. farm income in a global economy. Supported U.S. prices reduced international marketing opportunities and increasing global supplies undercut domestic production control efforts. Farm legislation passed in 1985 and 1990 maintained the traditional combination of price supports, supply controls, and income support payments, but introduced changes that moved farmers toward greater market orientation i.e. lower price supports, greater planting flexibility and more

1 attention to developing export opportunities for farm products. Also was introduced in the
2 1985 Farm Bill environmental cross compliance measures in order to address specifically
3 issues of soil erosion and conservation of humid areas. This Farm Bill also reintroduced direct
4 subsidies to farm exports: Export Enhancement Program (EEP) and Targeted Export
5 Assistance and TEA.

6
7 As Cochrane explained, the stable economic development provided by farm programs in
8 conjunction with rapid technological development resulted in rapid adoption of new and
9 improved technologies on farms, relatively heavy investments in non-farm produced inputs,
10 increased production efficiency and a rapid rate of growth in aggregate production capacity
11 which exceeded aggregate demand (Cochrane, 1987).

12
13 **[Insert Figure 2B.1: Evolution of global factor productivity in US agriculture 1910-2004]**

14
15 **[Insert Figure 2B.2: Evolution of main commodities yields 1900-1999]**

16
17 Several shortcomings of these farm programs have to be touched on. First of all, the failure to
18 understand the nature of the problem confronting commercial agriculture during the period
19 between the end of the Korean War and the increase of the demand for agricultural exports at
20 the beginning of the 70's, that is to say the structural excess capacity problem. This problem
21 was largely understood as a temporal one. That led to various weaknesses in the farm
22 programs: for instance, unwillingness to impose strict production controls and the tendency to
23 impose production controls over only the commodity in most serious oversupply and permit
24 the released resources to shift into the production of other commodities. This last weakness
25 was not seriously addressed until the 80's. Another important shortcoming of the farm
26 programs was the almost complete reliance on acreage controls as a means of controlling
27 supply, what was actually a weak and slippery form of control that induced the substitution of
28 fertilizer, pesticides, machinery and power for land and labor, contributing to the land and
29 water pollution of modern agriculture (Debailleul, p 297).

30
31 In the beginnings of farm programs, acreage diversion was also considered as a means to
32 reduce the soil erosion, an important problem dimension of the agricultural crisis of the 30's.
33 But farmers tended to divert the less productive parts of their land and to intensify the
34 agricultural practices on the most fertile part of their land, often the most vulnerable to the
35 erosion. The farm policy was supposed to protect farmers against sharp declines in
36 agricultural prices and in the same time to contribute to provide consumers with declining
37 prices for food, what was possible due to the improvement in farm productivity. But
38 experience shows that in periods of rapidly increasing farm prices like during the period 1972-
39 1975, consumers were not protected against the rise of food prices.

Common Agricultural Policy and the building of a single market

As North American agriculture, European agriculture was greatly affected by the economic crisis of the 1930's. Following the sharp drop in the prices of U.S. agricultural products, imports from the U.S. increased and depressed the European markets and farmers' incomes. First response of European countries was an increase in protectionist barriers.

After WWII, most of Western European countries pursued with their protectionist policies in order to increase self-sufficiency and reduce their agricultural trade deficits. As a consequence, food prices were maintained at a high level. Production responses to this high food prices were different from a country to another one. In several countries, the agricultural sector began to modernize and became more competitive and in some other countries, agricultural structures were still inefficient. So, on the eve of the creation of the six countries European Community, the status of agriculture differed greatly among nations.

The implementation of Common Agricultural Policy (CAP) was supposed to be divided in two periods: the period from 1958 to 1970, the "transitional period" was supposed to experiment the new instruments and the "permanent period" beginning in 1970 was devoted to the achievement of a single agricultural market. Actually, the transition to the permanent phase was completed in 1968.

The objectives assigned to the CAP were the following:

- to increase agricultural production through the development of technological progress as well the efficient use of factors of production, in particular labor;
- to ensure equitable standards in living for farm people particularly through an increase of personal income
- to stabilize markets
- to secure food supply
- to ensure reasonable prices for the consumers

Initiated in 1962, the CAP is a domestically oriented farm policy based on three major principles:

- A unified market in which there is a free flow of agricultural commodities within the EU;
- Product preference in the internal market over foreign imports through common customs tariffs; and
- Financial solidarity through common financing of agricultural programs.

That means that individual nations were supposed to gradually leave their decision-making power in agricultural matters, both at the domestic and international levels in the hands of the Community. Simultaneously, decisions made in Brussels were to be applicable equally to all

1 member states. The CAP's main instruments include agricultural price supports, direct
2 payments to farmers, supply controls, and border measures. Major reform packages have
3 significantly modified the CAP over the last decade. The first reform, adopted in 1992 and
4 implemented in 1993/94, began the process of shifting farm support from prices to direct
5 payments. The 1992 reforms reduced support prices and created direct payments based on
6 historical yields, and introduced new supply control measures. These reforms affected the
7 grain, oilseed, protein crop (field peas and beans), tobacco, beef, and sheep meat markets.
8 The second reform, "Agenda 2000 » began implementation in 2000 in preparation for EU
9 enlargement. Similar to the first CAP reform, Agenda 2000 used direct payments to
10 compensate farmers for half of the loss from new support price cuts. Agenda 2000 reforms
11 focused on the grain, oilseed, dairy, and beef markets. The most recent reforms began as a
12 midterm review of Agenda 2000 and resulted in a third major set of reforms in June 2003 and
13 April 2004. The latest reforms represent a degree of re-nationalization of farm policy, as each
14 member state will have discretion over the timing (from 2005-07) and method of
15 implementation. The 2003 reforms allow for decoupled payments—payments that do not
16 affect production decisions—that vary by commodity. Called single farm payments (SFP),
17 these decoupled payments will be based on 2000-02 historical payments and replace the
18 compensation payments begun by the 1992 reform.

19 When member states implement the reforms, compliance with EU regulations regarding
20 environment, animal welfare, and food quality and safety will be required to receive SFPs.
21 Moreover, land not farmed must be maintained in good agricultural condition. Coupled
22 payments, which can differ by commodity and require planting of a crop, are allowed to
23 continue to reinforce environmental and economic goals in marginal areas. Cuts in
24 intervention prices were made for rice, butter, and skim milk powder, to begin in 2005.
25 Intervention support for storage was limited for rice and butter and eliminated for rye in 2004.
26 In addition, the CAP budget ceiling has been fixed from 2006-13, and—if market support and
27 direct payments combine to come within 300 million euros of the budget ceiling—SFPs will be
28 reduced to stay within budget limits.

Domestic price support

31 Domestic price supports are the historical backbone of CAP farm support. Prices for major
32 commodities such as grains, oilseeds, dairy products, beef, veal, and sugar depend on the
33 EU price support system, although price support has become less important for maintaining
34 grain and beef farmers' incomes under the CAP reforms. The major method of maintaining
35 domestic agricultural prices is through price intervention and high external tariffs:

- Authorities buy surplus supplies of products when market prices threaten to fall below agreed minimum (intervention) prices.

- The CAP applies tariffs at the borders of the EU so that imports of most price-supported commodities cannot be sold in the EU below the internal market price set by EU authorities.

Farmers are guaranteed intervention prices for unlimited quantities of eligible agricultural products. This means that EU authorities will purchase, at the intervention price, unlimited excess products meeting minimum quality requirements that cannot be sold on the market. The surplus commodities are then put into EU storage facilities or exported with subsidy. While less important from a budget perspective, exports of processed products that contain a portion of a CAP-supported commodity also receive an export subsidy, based on the proportion of the commodity in the product and the difference between the intervention price and the world price.

Other mechanisms, such as subsidies to assist with surplus storage and consumer subsidies paid to encourage domestic consumption of products like butter and skimmed milk powder, also support domestic prices. The 2003 reforms, however, cut storage subsidies by 50 percent. Some fruits and vegetables are withdrawn from the market in limited quantities by authorized producer organizations when market prices fall to specified levels. Reforms have lowered the cost of the CAP to consumers as intervention prices have been reduced. However, taxpayers now bear a larger share of the cost because more support is provided through direct payments.

Direct payments

While price support remains a principal means of maintaining farm income, payments made directly to producers provide substantial income support. Compensation payments for price cuts generated by the 1992 reform began in 1994 and were increased for the price cuts of the Agenda 2000 reform. These compensation payments were established on a historical-yield basis for arable crops by farm, and farmers had to plant to receive the payment. In contrast, the payments specified in the 2003 reform will be made to farmers based on the average level of payments made during 2000-02 and no production is required. In the livestock sector, headage payments (payments per animal) will be made in the beef and sheep sectors based on 2000-02 average payments with no production required. Other special payments are made, but they are relatively minor in value. Direct payments currently account for about 35 percent of EU producer receipts and for an even higher percent of net farmer income (once input costs are subtracted from receipts).

Supply control

The 1992 reforms instituted a system of supply control—through a mandatory paid set-aside program to limit production—that has been maintained through subsequent reforms. To be eligible for direct payments, producers of grains, oilseeds, or protein crops must remove a specified percentage of their area from production. Agenda 2000 set the base rate for the

1 required set-aside for arable crops at 10 percent. The rate was reduced to 5 percent for 2003-
2 04 because of drought-reduced crops in 2002-03. Producers with an area planted with these
3 crops sufficient to produce no more than 92 metric tons of grain are classified as small
4 producers and are exempt from the set-aside requirement. Supply-control quotas have been
5 in effect for the dairy and sugar sectors for nearly two decades.

6 7 *Border measures*

8 The CAP maintains domestic agricultural prices above world prices for most commodities. In
9 preferential trade agreements, such as those with former colonies and neighboring countries,
10 the EU satisfies consumer demand while protecting high domestic prices through import
11 quotas and minimum import price requirements. The CAP also applies tariffs at EU borders
12 so that imports cannot be sold domestically below the internal market prices set by the CAP.
13 Although the Uruguay Round Agreement on Agriculture called for more access to the EU
14 market, market access to the EU's agricultural sector remains highly restricted in practice. In
15 addition, the EU subsidizes the agricultural exports to make domestic agricultural products
16 competitive in world markets.

17 18 *Additional aspects of 2003 reform*

19 Important components of the 2003 reform reflect a philosophical change in the approach to
20 EU agricultural policy. For the first time, much of the pressure to reform the CAP came from
21 environmentalists and consumers. The requirement to comply with environmental and animal
22 welfare standards to qualify for the SFP reflects these pressures. Moreover, farmers must
23 meet food quality and food safety regulations for payments to continue. Another important
24 feature of the 2003 reforms is the move from a price support policy to an income support
25 policy through decoupled payments. EU farmers will have more choices in their planting
26 decisions because of decoupled payments. Commodity support prices continue to exist but at
27 lower levels, while direct payments to farmers without requirements to plant a crop are more
28 widespread.

29 30 **[Insert Figure 2B.3: The evolution of CAP expenditures]**

31
32 There is also a marked shift in the way rural development is treated. The 2003 CAP reforms
33 established two pillars in the budget: Pillar I for market and price support policies and Pillar II
34 for rural development policies. In the reforms, a ceiling was imposed on Pillar I spending,
35 while Pillar II spending seems open-ended. The intended budget for rural development will
36 more than double over the next 10 years, while the CAP budget for Pillar I may only increase
37 by 1 percent per year in nominal terms from 2006-13. Moreover, in a concept called
38 modulation, SFP payments greater than 5,000 euros are reduced by 5 percent, while farmers
39 whose SFP is less than 5,000 euros are not penalized. The budget funds saved through
40 modulation are transferred to the Pillar II rural development fund. At least 80 percent of the

funds from the penalties will remain in the country where the SFPs were reduced and are to be used for rural development purposes.

The increase in agricultural productivity within the European Community has been very rapid. While increases in the rate of agricultural productivity in the United States have been visible since the Thirties, this trend began in the Fifties in the Community and continued in the subsequent decades primarily due to the implementation of CAP. To be sure, protectionist policies were employed by EC member countries before the Common Agricultural Policy was established in 1962. Nevertheless, CAP played a fundamental role in increasing the size of supply and the agricultural productivity

Benefits and shortcomings of farm policies

Consumers have received some benefits from price stabilization since the probability of shortages and extremely high prices is lower. A large part of gains in agricultural productivity have also been transmitted to the consumer through a long-term tendency of declining real farm prices. Food processing firms probably did also benefit since more stable supplies and prices could result in more efficient use of processing facilities and improved management decisions. It may have been the same for industry providing non-farm inputs to the agriculture as farm programs constituted great incentive for investment and adoption of new technologies. For the same reasons livestock producers probably also benefit from grain price stabilization and government storage policies.

As for the impact of farm policies on the structure of agriculture and despite the fact that an underlying theme of farm policies either in the United States or in Europe was the support to the family farm, it has been argued that long run effects benefited larger farms. It is well known that higher price supports, benefits, deficiency payments, or disaster payments, as well as direct aids are generally proportional to output or to acreages. It is also well known that between 20% and 30% of the farmers are able to capture between 60 and 80% of government payments either in US or in EU. For instance, 70% of the direct payments of CAP during the financial year 2000 went to 16% of EU eligible farmers.

The results of US and European attempts to dispose of surplus commodities were particularly damaging for the developing countries agricultural sectors. The availability of cheap surplus food from Europe and the US has made it possible for some nations to maintain urban food prices at relatively low levels. Such a situation discouraged production by Third World farmers and encouraged rural people to migrate to the cities. In addition it made the welfare of poor nations depend upon American and European willingness to continue to overproduce agricultural commodities (Bonnano and al. p.235). Moreover, the modernization and intensification of agriculture that have been promoted by these policies had, mainly in the last

two decades, damaging environmental and social consequences that have not been entirely addressed by the reforms of the farm programs.

2B.1.2 Changes in Farming and Rural Population in North America

While the total U.S. population has doubled since the mid 1940s (Figure 2B.4), the portion of rural dwellers has declined from nearly 50 percent in 1945 to about 21 percent in 2005.

Mirroring these changes in population have been changes in the agricultural workforce. In 1945, 16 percent of the total labor force in the United States was employed in agriculture, but this dropped to 4 percent by 1970 and 1.9 percent by 2002 (see Table 2B.1). Primary farm operators also begin to work more off-farm jobs during this time period. In 2002, 93 percent of farm households had off-farm income, a three-fold increase since 1945, when 27 percent of farmers worked off-farm (Table 2B.1).

This shift in the relative percentage of urban to rural dwellers is often perceived as an exodus from rural areas, but during this time the total rural population has held relatively constant. Similarly, the total amount of farmland, and cropland has held relatively constant since the 1940s (Figure 2B.5). However, there have been very clear changes in the structure of the U.S. farming community. The number of farms in the United States dropped from 5.9 million in 1945 to 2.1 million in 2002 (see Table 2B.1). From the 1940s through the 1970s there was a steady decline in the number of farms with a corresponding rise in the average size of farms (see figure 2B.6). The decade of the 1950s saw the largest exodus from farming (Lobao 1990) while 600,000 farmers exited farming between 1979 and 1985 (Heffernan and Heffernan 1986), the latter characterized as the “Farm Crisis” of the 1980s that particularly impacted the economic base of rural communities in the Midwestern states.

Common ways to measure changes in the structure of farms is to look at sales per farm, acreage size, or ownership structure. Change is evident across all three categories. Of the 2.1 million farms in the United States, 58 percent or 1.2 million have less than \$10,000 in agricultural sales per year, while less than 500,000 farms gross \$50,000 or more in agricultural sales (see figure 2B.9). According to this measure, farms in the United States now have a bimodal distribution, with the number of farms in the middle declining (see Figure 2B.9).

Farms also tend to be increasing in size in the U.S. the average farm size has increased from ~ 80 hectares in 1945 to ~180 hectares in 2002. Part of this is due to specialization (see introduction) because of mechanization and markets; the average number of commodities produced per farm has fallen from 4.6 in 1945 to 1.3 in 2002 (Dimitri and Effland 2005). However, the number and average size of farms can be a misleading picture as few farms are “average”. Figure 2B.7 shows the shift in the size distribution between 1959 and 2002. The number of farms that were in the smaller and mid-size categories has decreased significantly

1 while the number of large farms has grown as would be expected from the reduction in
2 number of farms. Nevertheless, the number of smaller and mid-sized farms is still the most
3 common by number. Since the 1980s, the numbers of farms and average size have
4 undergone little change.

5
6 A third measurement, family ownership of the farm seems to be holding steady (see a larger
7 discussion of ownership in section 2B.1.3). The majority of farms (98 percent) in the U.S. as of
8 2003 are family-owned farms (though they may be organized as proprietorships, partnerships,
9 or family corporations; Hoppe and Banker, 2006). Even the largest farms tend to be family
10 farms.

11
12 It is also important to look at the geographical consequences of changes in the farming
13 population. For instance, farm size in the US Heartland rose by 18percent between 1980
14 and 2000 (Paul & Nehring, 2005). Similar strong growth in farm size occurred in the Lake
15 and Northern Plains states but slower growth was evident in some other areas. Farming
16 dependent counties were sprinkled throughout much of the U.S. in 1950. By 2000, the bulk of
17 farming dependent counties was concentrated in the Great Plains of the United States, a
18 giant swath in the middle of the country stretching from the Prairie Provinces of Canada to the
19 panhandle of Texas (Dimitri, Efland and Conklin 2005).

20
21 While agricultural production is now highly concentrated in large farms, there still are a large
22 number of more diverse small farms coexisting with a small number of very large farms that
23 capture most of the markets for agricultural commodities (Miljkovic, 2005). A more restricted
24 study from Ohio by Medley *et al.* (1995) compared agricultural changes between the 1930s
25 and 1980s. This study showed that crop diversity declined the area of grain crops increased
26 and woodland on farms declined, although the area of forestry did not. During this period the
27 number of farms decreased by 60percent and farm size increased from 37 ha in 1925 to 72
28 ha in 1987.

29
30 An examination of farm by type of ownership-operation provides a more useful look at the
31 diversity of farm types currently in the U.S. Figure 2B.8 shows that the distribution of land in
32 different types of farms is distributed fairly evenly through a variety of types of operations,
33 ranging from part-time farmers (see definitions with Figure 2B.8) to very large scale
34 operations. The large-scale, very-large-scale, and non-family farms represents a very
35 disproportionately large fraction of the total U.S. farm production (73 percent of the production
36 from 38 percent of the farm area).

37
38 **[Insert Table 2B.1: 100 years of structural change in U.S. agriculture]**

39
40 **[Insert Figure 2B.4: U.S. Population, total and rural]**

[Insert Figure 2B.5, U.S. Total Farm Area, total cropland and total irrigated lands over time]

[Insert Figure 2B.6, Number of farms in the U.S.]

[Insert Figure 2B.7: Size Distribution of Us farms]

[Insert Figure 2B.8 Percent of US farmland area and percent of total U.S. farm production by type of farm in 2005]

[Insert Figure 2B. 9: Agricultural sales categorized by value on farms in USA 2002]

A similar story exists for Canada. The total population engaged in farming has declined, while the total rural population has stayed relatively constant (see Fig. 2B.10). However, both the rural and farm populations have significantly declined as a percentage of total population. Total cropland has increased slightly, while land in farms has stayed constant (Fig. 2B.11). Since the 1980s, the average farm size has increased, while the number of farms has decreased (Fig. 2B.12). As in the U.S., the greatest number of farms is to be found in the smaller and mid-sized categories (Fig. 2B.13) The fewer number of large farms are responsible for the majority of production as well (Figure 2B.14).

[Insert Figure 2B.10: Canadian population over time]

[Insert Figure 2B.11: Total amount of Canadian farmland and total croplands]

[Insert Figure 2B.12 Number of farms and size of farms over time]

[Insert Figure 2B.13: Size distribution of Canadian farms in 2001]

[Insert Figure 2B.14: Distribution of farm size by income and percentage of total Canadian gross farm receipts by income category]

2B.1.3 Changes in European farm size and labor force

Europe emerged from the 1940s with a farming predominantly consisting of small 'mixed' farms. As technology advanced during the following 50 years the number of farms and indeed the number of farmers and farm workers has decline dramatically. In 1950 in England there were approximately 250,000 farms bigger than 2 ha and a labor force of 687,000 people. By 2000, the number of farms had declined to less than 150,000 and the labor force to 375,000 (Defra, 2006). Similar trends are apparent in other western European countries. In W. Germany, for example large farms (i.e. those over 2 ha) have declined from over 1,000,000 to less than 400,000, whilst the number of 'small farms', mainly run by part-time farmers has declined even more dramatically. At the same time the area of farmed land has only declined from 12.8 million ha in 1949 to 11.4 million ha in 2001 (source bmelv-statistik.de), indicating that there has been a dramatic increase in average farm sizes (Figure 2B.15). In France the

1 agricultural workforce declined from 8percent to about 4percent of the total working
2 population in the period of 20 years from 1977 to 1997.

3
4 **[Insert Figure 2B.15: Changes in the number of farms in W Germany 1949-2001]**

5
6 However, since the reform to the Common Agricultural Policy (CAP) in 1992 this decline in
7 Europe, both in agricultural employment and the number of farms, has slowed down as can
8 be seen in the annual percentage changes in labor force shown in Figure 2B.16. Different
9 countries and different areas in those countries have followed this pattern since 1990 to
10 varying extents. Eurostat data plots the decline in numbers of farms (holdings) since 1990
11 (Figure 2B.17), but this does not show the very major declines that occurred in the 1960s and
12 1970s.

13
14 **[Insert Figure 2B.16 Annual percentage changes in the size of the agricultural labor force in the EU]**

15
16 **[Insert Figure 2B.17 Changes in the number of holdings (x1000) in several EU countries 1990-2003]**

17
18 The changes in the agricultural labor force differ greatly throughout Europe with a noticeable
19 North-South divide (Figure 2B.18). Southern European countries such as Spain and Portugal
20 have lost more than a third of their labor force in the decade from 1987 to 1997 whilst the
21 average for the European Community for this same period was a reduction of agricultural
22 labor by a quarter. This more dramatic decline reflects that fact that these southern Member
23 States also traditionally have a more labor-intensive Mediterranean style of agricultural
24 production. For example 1997 Eurostat figures showed that approx 9 percent of jobs in
25 countries with Mediterranean production systems were associated with farming. Greece has a
26 particularly high agricultural employment of approx 20 percent. Northern European countries
27 such as Denmark and the UK showed average agricultural employment figures for 1997
28 closer to only 3percent (Figure 2B.19).

29
30 **[Insert Figure 2B.18 Agriculture employment shares (percent) 1950 to 1990]**

31
32 The changes in Eastern Europe are more complex as the communist era greatly reduced the
33 number of farming units, by collectivization. In E. Germany in 1945 all large farms were
34 broken up and given to the farm workers. This was not successful and by the 1950s many of
35 these new farmers had left the land to work in the new factories and collectivization started
36 resulting in the establishment of large collective farms. Then, following the demise of this
37 system of land management in c. 1990 there has been a variable re-allocation of land to
38 former owners, resulting in fragmentation of the farming units. In turn there followed a re-
39 amalgamation of the small units to create more financially viable enterprises (Bouma *et al.*,
40 1998). In the former E. Germany there were 15,000 farms in 1991 but this had increased to
41 over 28,000 in 2001 (source bmelv-statistik.de).

Despite the general trend observed across Europe for a decline in farm numbers, increase in farm size and laying-off of farm workers, some countries have seen a recent change in emphasis towards developing new on-farm enterprises, expansion into higher value-added crops and engagement in environmental schemes. These activities have actually resulted in an increase in agricultural labor in countries such as Denmark and Greece. Similarly, the recent rise in consumer demand for organic produce has seen an increase in labor in this part of the farming sector to meet the labor intensive operations and to provide the necessary technical support. For example, data for Denmark has shown that conversion to organic farming has lead to a 38 percent increase in labor costs. A small increase in job creation in the agricultural sector is also resulting from the rise in agri-environment schemes such as those being implemented in the UK.

[Insert Figure 2B.19 Agricultural employment as a proportion of total employment, 1997 (percent)]

[Insert Figure 2B.20: Share of women in permanent agriculture workforce in 1997]

The agricultural workforce in Europe is traditionally dominated by family members, but again this differs greatly between Member States. Countries such as the UK have a relatively low proportion of family members employed in farming whilst for Finland over 97percent of agricultural workers are family members.

The contribution of women to the agricultural workforce largely reflects the overall declining trend in farm employment in the European region. Overall, women make up more than one in three of the European agricultural workforce. However, women make a greater contribution to the agricultural labor force in Southern European countries than Northern, with the exception of Finland (Figure 2B.20). In France, fewer farmers' wives now work on the farm: approximately half of them in 1997, as against three quarters in 1979. Part-time work is also less widespread in Northern European Countries compared with southern Europe. This high level of part-time employment in southern Europe is associated with the greater number of seasonal activities in this region and is reflected in the employment of both men and women, but is generally more common among women. As a result many women make a significant contribution to off-farm income by pursuing their own careers and developing new professional opportunities. In Western Europe women are mainly employed as low-skilled workers, whereas in the Central Eastern European Countries (CEEC), they often play a more professional or skilled role (source Howard-Borjas & S. de Rooij "Rural women and food security: Current situation and perspectives" FAO 1998 <http://www.fao.org/docrep/003/w8376e/w8376e06.htm#3.2percent20womenpercent20inpercent20agriculturepercent20inpercent20thepercent20ceec> accessed July 3 2006). As in North America, farm income in Europe is increasingly from off-farm salaries. For example in Finland only 50 percent of farm income is from agriculture. The remaining income is from farm

forestry (between 10 and 15 percent) and off-farm salaries (source Heinonen 2002,
http://www.organic-europe.net/country_reports/finland/default.asp accessed 3 July 2006)

The combination of female equality, which has been more extensively promoted in CEEC and low male wages, has resulted in a much greater contribution by women to the agricultural workforce in CEEC than in many Western European countries (Table 2B.2). The reduction in agricultural employment has, therefore, had a generally greater negative effect on female employment in these CEEC countries.

[Insert Table 2B.2: Rates of participation in the labor force of women 40 to 44 years of age in various countries, 1950-1985 (percentage)]

2B.1.4 Changes in market structure for agricultural inputs and outputs

In Europe, concentration in the food system started at the retail stage becoming most obvious during the 1980s and 1990s (Vorley, 2003). In the United States, concentration of ownership and control became most obvious at the production and processing stages, especially in the poultry sector in the mid-twentieth century. Contrary to European trends, in the U.S. and Canada increased market share by fewer firms occurred in the agricultural input sectors and the food processing stage much earlier than in the food retailing sector.

2B.1.4.1 Horizontal Integration

All sectors of the agrifood system have seen the impacts of horizontal integration in North America, while it is most apparent in Europe in the retail sector (discussed in the next section).

Horizontal integration is occurring at all stages of the food system from the genetics to raw agricultural commodities to food retailing. The concentration ratio (CR4), which is a measure of the market share of the top four firms in a particular commodity, has continued to increase during the past decade in the U.S. The largest four processors for all the major commodities now have from 50 to 80 percent of the market share (see Tables 2B.6 and 2B.7).

The share of U.S. seed sales controlled by the four largest firms providing seed of each crop reached 92 percent for cotton, 69 percent for corn, and 47 percent for soybeans in 1997. One contrast to this general trend was wheat, with more than 70 percent of the planted wheat in 1997 coming from varieties developed in the public sector. However, herbicide-tolerant varieties of wheat developed by the private sector are on the horizon, so the private proportion could increase (Fernandez-Cornejo and Schimmelpfennig, 2004).

[Insert Table 2B.3 Estimated seed sales and shares of U.S market for major field crops, 1997]

1 Today, about four NAE seed firms dominate the market for commercially available seeds in
2 North America and worldwide (UNCTAD 2006). With Monsanto's acquisition of Seminis, the
3 firm provides roughly one-third of the seed used to grow the fruits and vegetables found in
4 most U.S. supermarkets. Trade reports indicate a 23% share of the world's tomato-seed
5 market, a 34% share of the hot pepper-seed market and 38% of the cucumber-seed market
6 (Kilman, 2005).

7
8 **[Insert Table 2B.4 Global seed and pesticide sales of major multinational firms 1999]**
9

10 Two NAE firms, Cargill and Yara, provide most of the fertilizer used today in North America.
11 Mosaic, recently created through a merger between Cargill and ICM where Cargill owns 67%
12 of the new company, will produce 14.4 percent of the world's phosphate, and 15.5% of the
13 world's potash (Seewald, 2004). The International Fertilizer Development Center estimates
14 this company will have 50-60 percent share of the U.S. fertilizer market. The European
15 fertilizer market comprises 9.1 Mt nitrogen, 3 Mt phosphate and 3.5 Mt potash. From global
16 fertilizer consumption of 135.8 Mt, Agri (Norsk Hydro) has around 25% market share for
17 fertilizers in Europe. Imports have approximately the same market share, and could be
18 regarded as the main competitive supply. None of Agri's competitors have European market
19 shares above 15%. These other European suppliers are Fertiva (K+S), Kemira, Grande
20 Paroisse (Atofina/Total), Fertiberia, Terra, DSM and smaller players.

21
22 In the U.S. less than 10 firms slaughter and process most of the broilers, turkeys, cattle
23 (heifers and steers), and pork in the United States. Many of these are the same firms that
24 operate in Canada. Moreover, the CR4 ratio has been increasing for all livestock processing –
25 particularly steers and heifers and hogs – since 1980 in the U.S. (USDA, 2000) Livestock
26 production in Europe is less consolidated than in North America. For instance, the top 10
27 integrated broiler producers in Europe account for only 36% of production compared with 66%
28 in the US.

29
30 **[Insert Table 2B.5 European pig slaughterhouses 2002]**
31

32 **[Insert Table 2B.6 Concentration in the U.S. Food Industry]**
33

34 **[Insert Table 2B.7: Selected Information about Concentration in the Canadian Agriculture and Food Industry]**
35

36 In the U.S. grain sector, four firms – Cargill, CHS (Cenex Harvest States), ADM and General
37 Mills – control 60% of the terminal grain handling facilities. Cargill and ADM, combined with
38 Zen-Noh, export 81% of U.S. corn and 65% of U.S. soybeans.¹ Bunge, a U.S. based firm,
39 became the largest oilseed processor in the world, and the dominant oilseed processor in
40 North America, with its acquisition of the French firm Cereol in late 2002. In Europe, the

crushing industry has crushing capacity of approximately 30 Mt, around half of which is soybeans. Europe also imports around 18 Mt of soy meal. ADM, Bunge and Cargill together control almost 80% of European crushing industry. These three players are in the process of rationalizing crushing capacity, closing down some factories, and increasing the utilization rate of others.

During the 1990s, intensive mergers among farmer dairy cooperatives left only two major U.S. cooperatives, Dairy Farmers of America (DFA), which currently produces 33 percent of the U.S. milk supply, and Land o' Lakes. In addition, Suiza Company (Dean Foods) merged with Dean Foods, the second largest dairy processor, to become the largest dairy processor controlling 30 percent of the U.S. milk supply. Saputo, the number one cheese processor in Canada, is among the top 20 dairy processing countries worldwide.

Across Europe, there has been a process of international consolidation in dairy processing, led by farmer-owned businesses in the race to remain competitive with multinational companies. Concentration in dairy is also a trend in Central and Eastern Europe (Csaki and Forgacs, 2004)

The major food manufacturers in the NAE are Nestle, Unilever, Kraft and ConAgra. It is estimated that 60 percent of retail food purchases in the United States go to the ten largest global food corporations (Lyson and Raymer 2000).

The major food manufacturing countries in Western Europe are France, Germany the UK and Italy (Figure 2B.21). Meat, beverages, and dairy are the biggest sectors, comprising 20, 15 and 15% of value of production in 2001 of over EUR 600 billion (USDA-FAS, 2003). It is Europe's leading industrial sector and third-largest industrial employer.

[Insert Figure 2B.21: EU-25 Food and drink sector 2001, value of production (EUR billion) estimates]

The top manufacturers are listed in Table 2B.8. Concentration in the food manufacturing sector is relatively low.

[Insert Table 2B.8: Top European food manufacturers, ranked by turnover in 2002]

2B.1.4.2 Vertical integration, strategic alliances and food system clusters

The same firms appear in different sectors of the food system, from genetics to processing. Vertical integration refers to firms acquiring operations in more than one stage of the food system. It is not a new term, or process, although it has accelerated rapidly in the NAE since 1945. Mostly, this process combines the management (but historically ownership) of a series of stages in the food system. Vertical integration leads to supply chain management, which when exercised in non-competitive markets resulting from horizontal integration, replaces the competitive market providing the coordinating function in a competitive system.

1
2 We can look to NAE, particularly the U.S., to see some early examples of vertical integration.
3 One of the best known examples of vertical integration has been the poultry industry in the
4 U.S., although pork production has almost completed the transition to this form. The poultry
5 industry has now become the prototypical model of industrialized agriculture and is often
6 referred to as a model of the structure that may come to characterize much of U.S. farming in
7 the future (Perry, Banker and Green, 1999; Hendrickson et al., 2001). Before the 1950s,
8 chickens were raised on more farms in more regions of the U.S. than any other farm animal.
9 The chicken farmer was supported by thousands of local hatcheries, feed mills and
10 processors where chicks, feed and other supplies could be purchased and the birds could be
11 sold. Following the Second World War, large feed companies recognized the broiler industry's
12 potential for growth and moved quickly into the production of broilers (Heffernan 1998;
13 Martinez 1999; Ollinger, McDonald et al. 2000). These companies began buying up
14 hatcheries and developing relationships with retailers. By 1960, 286 firms were selling broilers
15 (Heffernan, 1972) and the top four firms controlled 12 percent of the market. By 1998, only 52
16 firms remained, and in 2005 the top four firms accounted for 56 percent of the market. Today,
17 a typical broiler complex includes breeder farms, hatcheries, feed mills, grow-out farms,
18 processing plants and retail markets. Commercial feed firms became the major consolidators
19 in the broiler industry. As the first integrating firms, they manufactured the feed, sent it by
20 truck to growers, picked up the matured broilers, and transported them to their slaughtering
21 facilities located near the feed facility. They would ordinarily travel out 25 to 30 miles in a
22 circle from the processing plant to the growers' buildings (Heffernan, 1984). The geographical
23 layout is much the same today except the number of integrating firms and the number of
24 processing facilities are greatly reduced. These firms have about 250 sets of processing
25 facilities across the country producing broilers. Very few growers live in an area where two
26 circles of competing integrating firms overlap. As a result, most growers live in places where
27 they have access to only one integrating firm.

28
29 Vertical integration has been manifested through the development of food system clusters or
30 integrated food supply chains; both terms connote a direct line of control for a firm from one
31 stage of the food system to another. In 1999, Heffernan et al documented three emerging
32 food system clusters (Cargill/Monsanto, ConAgra, and Novartis/ADM) that appeared to be
33 dominant forces in the food system from genetic material to food manufacturing (see also
34 Hendrickson and Heffernan, 2002). These food chain clusters are still major entities in the
35 agrifood system, but have significantly evolved, including mergers and divestments. Other
36 strong firms remain that have likely formed, or will form, new clusters. For instance, the
37 transnational firm Bunge, the largest dry corn miller and oilseed processor in the world, or
38 protein giants, Tyson and Smithfield, may anchor new clusters. It is important to note that
39 much movement to reorganize supply chains in the early 21st century, particularly in the fruit

and vegetable sector, has come from large, global retailers, all of whom are based in the NAE, especially in Europe.

Rise of production and marketing contracts

One form of vertical integration is the agricultural contract, manifested either as a production or marketing contract. In the U.S., agricultural contracting covers nearly 40 percent of the value of agricultural production, up from 11 percent in 1969 (MacDonald and Korb 2006).

Production contracts exist when an integrating company retains ownership of the commodity as it moves through the chain, with growers receiving a fee for providing labor and/or capital. In marketing contracts, farmers retain ownership and use the contract to specify price, quantity and quality of product to be delivered. About 10 percent of all U.S. farms use a contract of some sort, with large commercial farms most likely to be involved in contract production (at 46.7 percent) (MacDonald and Korb, 2006). However, contract usage varies among commodities. Some sectors, such as poultry and hogs, have seen significant shifts to contract production. In 2003, nearly 60 percent of hogs and almost 90 percent of poultry and eggs were sold through contract production, primarily production contracts. Crops like vegetables, fruit and rice tend to have higher rates of contracting than corn, soybeans, wheat and sugar beets. Marketing contracts are much more prevalent in crop production while production contracts predominate in livestock production.

[Insert Table 2B.9 Distribution of the contract share of U.S. agricultural production by commodity and year, 1991-2003]

2B.1.5 Changes in cooperatives and marketing and support systems

The agricultural cooperative movement flourished in the U.S. from the beginning to the mid-20th century. Farmers joined cooperatives to market agricultural products, as well as to obtain farming inputs and services.

After the Second World War, farmer cooperatives thrived, even though many farmers left farming in the 1950s. The total number of farm cooperatives in the U.S. declined from a peak of 12,000 in 1930 to 6,293 in 1980 to 3,140 in 2002 (USDA, no date). Today less than 3 million farmers belong to cooperatives in the U.S. Agricultural cooperatives are concentrated primarily in the middle part of the country with high numbers of cooperatives and members in the Upper Midwestern states. The largest number of marketing cooperatives are engaged in grain and oilseeds, with fruits and vegetables second. However, the total number of cooperatives organized to supply farmers with supplies and services was slightly larger than the total number of marketing cooperatives.

Farmer cooperatives are more important in some sectors than others. The dairy sector, for instance, relies heavily on marketing cooperatives. In 1997, cooperatives marketed 87% of

U.S. milk purchased at the first handler level. Nearly one-fifth of fruits and vegetables and about 40 percent of grains and oilseeds were marketed through cooperatives. Cooperatives are less important in the livestock marketing sector.

Traditional agricultural cooperatives faced a number of challenges in the late 20th century. Traditional marketing and supply cooperatives confronted increased pressure from the consolidation of investor-owned firms and their increasing market share in traditional markets. Many cooperatives merged with other cooperatives, particularly in the dairy sector (Hendrickson et al 2001), and those marketing grains and oilseeds (Crooks, 2000). Others developed joint ventures and alliances with investor-owned firms. However, farmers were still interested in cooperatives. In the late 1980s, many farmers began to organize in what are called “new generation cooperatives.” At least 50 new generation cooperatives were established in the Midwestern U.S. in the 1990s (Reynolds, n.d.). These cooperative organizations focus primarily on value-added processing activities, and are different from traditional farm marketing or supply cooperatives.

In Europe, cooperatives are very important and powerful organizations in the marketing and processing of agricultural products, and in the supply of credit to farmers. For instance, agricultural cooperatives have captured almost majorities (or the entirety) of the dairy market in northern Europe and Ireland, and have significant shares of the markets for inputs in many western European countries.

[Insert Table 2B.10 Cooperatives' shares of U.S. farm marketing, by selected commodity group, 1997-95]

[Insert Table 2B.11 Market shares of agricultural co-operatives in the EU-15]

[Insert Figure 2B.22 Turnover of farmer-controlled businesses as percentage of agricultural output]

2B.1.6 Agricultural productivity and changes in agriculture in Central and Eastern Europe

This section presents some ideas on the nature, dissemination and effects of agrifood system transition and the development of AKST in Central and Eastern Europe Countries (CEEC) and in Russia and some of the Newly Independent States (NIS) ² since the Second World War, with emphasis on the "reform" or "transition" period since the break-up of the socialist bloc in and after 1989. In this section, the countries are Russia and its immediate European satellites, i.e. Estonia, Lithuania, Latvia, Poland, East Germany (until 1989), Czechoslovakia

^{2 2} Authors differ in the countries that are included under the rubric of the CEECs. Some authors restrict the definition to the ten countries that underwent accession to the EU between 2004 and 2007 namely Estonia, Latvia, Lithuania, Poland, Romania, Slovakia, Czech Republic, Hungary, Bulgaria, and Romania. Others include Albania, and the remaining Balkan states, but these are also referred to as the South East European Countries (SEEC). Most of the material in this section regards the CEECs as to the ten accession countries, unless other countries are referred to specifically. The NIS may include all the states the once made up the USSR, but in this section is restricted to Russia, Belarus, the Ukraine and the Baltic states.

(now two countries), Hungary, Romania, Bulgaria, Yugoslavia (now several new countries), and Albania, as well as Belarus and Ukraine. These cover a huge geographical area, from the limits of crop cultivation in the north to Mediterranean conditions in the south, and from the Tatras, Dolomites and Carpathian mountains to the "black earth" arable plains around the Black Sea. Politically, too, conditions have varied enormously, from the (very different) communisms of the Soviet Union and Albania to the special characteristics of the farming systems in Poland, Yugoslavia and Hungary.

In this section no overall definition or analytical structure for AKST has been used, instead, AKST is assumed to include:

- Applicable knowledge embodied in farm and farm-related personnel such as farm managers and workers, and those involved in input supply, crop and livestock advice, product delivery (quota collection and marketing) and research.
- The existence of high-quality variable inputs (fuel, seeds, fertilizer, etc.) and capital (buildings, machinery, drainage/irrigation systems, etc.) on farms and in farm-related enterprises.

The mere existence of the above resources even that of management expertise does not ensure that the resources will be allocated effectively allocated and used efficiently. Particularly in the socialist era, the use of non-market food-chain systems, and policies aimed at satisfying domestic and external political objectives such as food rationing and Comecon trading requirements, meant that incentives to operate in accordance with economic efficiency were often absent, or distorted.

The Second World War had devastating effects on all sectors of the economies of Central and Eastern Europe. For agriculture, these included the direct destruction of farming and food distribution resources, and disruptions due to labor displacement, especially of adult males. The hegemony of the Soviet Union in the post-war era imposed further constraints: most Central European countries were constrained to send supplies - generally of more valuable processed products - to the east.

On the other hand, many CEE countries had a long tradition of high-quality research and educational institutions geared to agriculture, and in many cases these were expanded and supplemented in the 1950s and 1960s as an element of the economic strategies being pursued. These institutions, alongside the restructuring of agricultural production into large state-controlled farming enterprises, determined the special character of AKST in the CEE countries until the 1980s. This AKST character was typified by:

- Capital intensification, via large-scale crop and livestock enterprises, and mechanization, encouraged in some countries by "machine stations" supplying tractors, combine harvesters, to production units;
- Widespread (and free) agronomic and veterinary expertise, sometimes located within individual farms: this extended to the provision of improved varieties of crops and livestock, as determined by state experimental and research stations;
- Emphasis on the management of quantities rather than qualities, encouraged by the lack of price signals as to quality, whether judged by processing enterprises or final consumers;
- Centralized input-supply and product-processing facilities to which farms were linked by state *diktat*.

These characteristics were most obvious within the Soviet Union itself, and in East Germany and Romania. Poland did not pursue full-scale restructuring of its agriculture after the War, and hence maintained a pattern of small-scale privately operated farms in most regions. In all CEE countries, free markets for food products were severely limited for several decades, their allocation role being taken by a combination of retail supplies - sometimes limited and erratic - at fixed prices, and communal catering in workplaces, schools, etc. However, the surpluses of small privately operated holdings, often of garden size were distributed via informal "green" markets. Moreover, "black market" supplies of foodstuffs and of feedstuffs for household livestock, from state or cooperative farms and businesses, were available to some.

The transformation of agricultural structures in CEE countries from small-scale peasant holdings or, in some areas, farming estates under aristocratic or ecclesiastical control had left the industry without many of the natural managers and skilled workers with the knowledge gained from years of familiarity. However, the new regimes were vigorous in their efforts to fill this gap with fully trained staff.

The impact of the ending of the socialist era in most of Central and Eastern Europe after 1989 was unforeseen (as was the break-up itself), and varied according to the suddenness of the change-over and the competence of incoming governments. In most cases, a marked decline in the livestock sector took place as the inherent inefficiencies and the lack of profitability of large-scale enterprises that depended on cheap feedstuffs and guaranteed outlets were exposed. The cropping sector fared better, but even here production fell in most cases.

An underlying factor in most transitions was the situation of the land and credit sectors, which together determined the ability - and sometimes the identity - of new landowners and farm-workers during the processes of land restitution and business privatization. In some countries, such as the Czech Republic, Slovenia and much of Poland, viable private farming businesses emerged quickly in the hands of families or companies. In Russia, Belarus and the Ukraine,

1 with their much longer period under socialism, and only partial acceptance of market-oriented
2 systems, structural transformation in the countryside was slow and patchy, despite harsher
3 economic conditions.

4
5 Hungary had introduced a considerable degree of economic independence in its agri-food
6 system since the 1960s while, as mentioned above, Poland had retained a large private
7 sector throughout. In Albania, the almost complete breakdown of the pre-existing system left
8 the countryside open to fragmentation and a shift to household self-sufficiency in food. This
9 process was evident in many CEE countries as regards the substantial proportion of the
10 population, often older, newly unemployed and unskilled, who retreated from the cities and
11 towns to rural housing where an older, poorer but more secure way of life could be pursued.

12
13 The national institutions of research and education in AKST in most CEE countries underwent
14 equal financial pressures during transition, and these continue. State budget allocations were
15 reduced, or lost value in real terms, and salary levels (often under direct state control) lost
16 value. Many of the brightest graduates were attracted by the new freedoms to pursue careers
17 in the commercial world, or abroad. Both universities and institutes were unaccustomed to
18 competition for project funding or to collaboration with commercial partners. Few were
19 actually closed

20 21 Post WW2 changes in agrifood systems

22 According to Medvedev (1987), the situation of agriculture in the post-war Soviet Union was
23 dire, with famine conditions in 1946-47, and per capita production of grain and meat below
24 1913 levels, and that of milk little better. Some causes were obvious - losses of labor and
25 capital (equipment and buildings) during the war - but others derived from inflexible and
26 arbitrary methods of coercion, extracting food from the countryside to feed the urban areas
27 with the expanding populations and developing industries. While several million more people
28 lived in the towns and cities in 1947 than in 1940, the rural population had fallen to 25 million,
29 and half of these were consumers rather than producers. Drastic measures, such as forced
30 movements of population, and the use of deportees and repatriated prisoners of war, were
31 employed to repopulate rural areas. However, the suppression of individual initiatives such as
32 the sale of food from private plots did not help, and state investment focused on large-scale
33 projects such as afforestation of the steppes and canalization required unavailable amounts
34 of management and labor.

35
36 In 1948, an ambitious agronomic and ecological plan, apparently rational in scientific terms
37 (e.g. conservation of soil and water, and crop rotation), was introduced, but proved impractical
38 or ineffective.

1 In the early 1950s, Khrushchev, with much more understanding of agriculture than his
2 predecessors, and with experience (administrative, not manual or management) of the large
3 *kolkhoz* of the Ukraine, pursued a policy of amalgamation of the small *kolkhoz* (collective
4 farms), first in the Moscow region and then more widely, in order to allow more rational use of
5 machinery from the Machine Tractor Stations (MTSs) which had been established in the
6 1930s. Repressive economic arrangements met with limited success, and further reform had
7 to await the death of Stalin in 1953.

8
9 In 1954, Khrushchev introduced the Virgin Land Program, aimed at increasing grain
10 production by utilizing the dry areas of Kazakhstan and other regions. The ploughing and
11 sowing of 36 million hectares - although resulting in large outputs of grain in 1956 and 1958,
12 required huge quantities of labor, equipment and infrastructure, whose supply prevented the
13 modernization of agriculture in the older western provinces. Moreover, as was appreciated by
14 Khrushchev and others, permanent utilization of the virgin lands would require more complex
15 farming systems, including the use of rotations and chemical fertilizers - whose production
16 and use were still at low levels.

17
18 A further setback derived from the abolition of the MTS system in 1958, with rushed allocation
19 of MTS assets and their (state) employees to the (nominally independent) *kolkhoz*. This threw
20 the whole agricultural machinery system, from factories to farms, into chaos for several years.
21 Medvedev, however, concludes that the imprint of the Khrushchev reforms on Soviet
22 agriculture was positive: more intensive development was needed, and produced results,
23 even if the introduction of structural and other innovations was often rushed.

24
25 The two decades after 1964 (when Brezhnev succeeded Khrushchev) saw the application of
26 more "economic" and "scientific" approaches to agricultural development, which remained a
27 state priority. Procurement prices were raised, private plots were restored to their former size,
28 and livestock (a weak sector until then) could again be kept privately. The production of
29 agrichemicals encouraged intensification and specialization. Nevertheless, again,
30 organizational and technical problems inhibited progress. Medvedev (writing in 1987:312)
31 says that: "[t]he relationships between the various bodies which are concerned in the
32 mechanization and chemicalization process represent a bureaucratic nightmare. Research
33 institutes are fragmented and serve different ministries. Design bureaus are linked to
34 industrial plants and not to farmers. There appears to be a drift towards a kind of anarchy in
35 which important sectors of agriculture are entirely neglected"

36 37 Agricultural Collectivization

38 The collectivization of agriculture is intended to exploit economies of scale, particularly in
39 respect of mechanization and in the use of agrichemicals. These are more obvious in large-
40 scale crop production, and possibly in intensive livestock production: they are less clearly

1 applicable to farming in mountainous areas, or with labor-intensive crops. However,
2 mechanization requires financing in some form or other, and this, plus the necessary
3 individual incentives to improve performance, has often been lacking (Meurs, 1999:20). .
4

5 According to Meurs *et al.* (1990), between 1945 and 1959, Bulgarian agriculture was almost
6 completely collectivized from a highly fragmented system of peasant-owned smallholdings to
7 over 3000 state-promoted cooperatives or TKZSs (*Trudova Kooperativna Zemedelska*
8 *Stopanstva*). Mechanization, with machines provided by the state, particularly in the early
9 years, and a Soviet-style MTS system, and the use of agri-chemicals (fertilizer use in 1954
10 was 10 times that in 1939, and that of pesticides 12.5 times) resulted in output rising by
11 around 3 per cent annually between 1949 and 1960. The process was most successful in the
12 grain-producing regions, less so in livestock-dependent mountainous regions or in the fertile
13 hinterland of Plotdiv where private plot production was particularly lucrative. Human capital
14 (and state control) was enhanced by requiring each TKZS to send a villager to state-run
15 courses in farm management, often to take on positions of responsibility on his or her return.
16 The "completion" of collectivization in 1955-58 was achieved by a combination of incentives
17 and pressures, plus a large agricultural modernization credit from the Soviet Union in 1956,
18 which enabled further mechanization, and substantial rises in the use of other inputs.
19 Although agricultural output fell by 16 per cent, increases in productivity allowed net output to
20 increase and living standards to improve, in both cities and the countryside.
21

22 After 1959, there began a period of consolidation, with the 3290 TKZSs "unified" into 932
23 OTKZSs, each averaging 4266 ha of land and 1736 permanent workers. The arguments for
24 this were both political (a further stage in socialism, with ownership moving from village to
25 municipality, easier state control of fewer units) and economic (economies of scale in the use
26 of machines, and the services of agronomists, veterinarians and economists). Mechanization
27 proceeded apace, mostly in the hands of the OTKZSs themselves rather than the MTSs, and
28 agri-chemical use continued to rise strongly. The labor force again fell - by 30 per cent
29 between 1958 and 1965 – but productivity and incomes both improved. However, labor
30 management at the OTKZS scale proved difficult, particularly in dealing with seasonal
31 demands, and the substitution of "brigades" for village groups did not prove effective.
32

33 By the late 1960s, agricultural growth had slowed, and the OTKZSs were merged into a few
34 hundred large state-run agro-industrial complexes (APKs). This increased the problems of
35 planning and management. Examples included many failures of input supply, the use of
36 unsuitable trucks to bring in the harvest, and the establishment of a sugar plant in a swamp.
37 The overall national plan favored industrialization over agriculture, thus limiting farm
38 investment, and long management and information chains led to inefficient practices. Thus,
39 although agricultural production continued to rise, it did so more slowly in the 1970s, due to a
40 combination of technical stagnation and organizational problems (Boyd, M., 1991). By the

1 mid-1980s, the degree of over-consolidation was widely recognized, and the former TKZSs
2 were granted legal independence. However, the APK managers were not easily dislodged or
3 ignored, and little progress had been made by the time of the collapse of the communist
4 system in 1989.

5
6 In Hungary, according to Kovach (1999), farm collectivization - often of land only recently
7 redistributed under the 1945 land reforms - began after 1948 when the Communist Party
8 finally won its dominance. This was carried out to various degrees, from individual harvesting
9 of collectively ploughed and sown cropland to Soviet-style *kolkhoz units*, but ran into
10 significant peasant resistance. Moreover, investment, e.g. in machinery, was limited by lack of
11 state resources for the collectives and by lack of access to credit for the still-important private
12 landowners. After 1956, a further and more careful effort resulted in a two-tier structure of
13 small-scale "part-time farms" run by households alongside large collective agricultural
14 enterprises, with sharecropping a significant feature. This mixed system, with increased
15 resources (other than labor, which continued to out-migrate) directed to agriculture under a
16 "balanced growth" strategy, resulted in significantly increased farm production.

17
18 The New Economic Mechanism (NEM) introduced uniquely in Hungary after 1968 involve a
19 relaxation of state control, but this had less effect on the country's agriculture where centrally
20 determined delivery targets had been abandoned in 1957. However, collective farms could
21 now negotiate and sign their own contracts, wages were linked to farm performance, and
22 controls over small-plot farming were loosened considerably, allowing greater specialization
23 within agriculture (e.g. rearing of young stock by households), and significant changes in the
24 rural way of life, e.g. commuting to the nearest town.

25
26 Between the late 1960s and the early 1980s, this combination of socialist and private
27 agriculture proved very successful. Both crop and livestock yields doubled or more, as a
28 result of good management, increased use of fertilizers and machinery, and the diversification
29 of many farm households into "pluriactivity", allowing flexible use of labor.

30
31 However, in the 1980s, this system began to fail, partly as a result of more intense
32 competition in export markets (both east and west), and partly because the markets in land
33 and other capital assets were still not free, thus discouraging investment, whether by farming
34 families or corporate bodies. Moreover, although management on collective farms was of a
35 high standard, manual labor was largely unskilled. Thus Hungarian agriculture lacked middle-
36 sized entrepreneurial farm businesses which might have continued the early dynamism.

37
38 Meurs (1990:239) suggests that collectivization of agriculture can bring out increases in
39 production and productivity through economies of scale and the use of new technologies, but
40 risks dramatic declines in agriculture performance if personal incentive systems are

1 destroyed. Moreover, national governments must operate appropriate pricing systems for
2 inputs and outputs, and ensure that investment in machinery takes place. In the 1980s, as the
3 once-for-all gains from collectivization ran out, further progress was only possible with
4 diminished central control, even to the extent of restricting collective action to the provision of
5 inputs and the marketing of bulk supplies, while households follow the Chayanovian model of
6 specialized production, especially of certain livestock products, wine, fruit, etc.

7
8 In several countries, there was resistance to the de-collectivization of agriculture, both by
9 planners fearing the loss of scale economies, and by individuals unable to see how they could
10 survive alone on a small piece of restituted land. In such cases, Meurs (1990) argues that
11 flexible forms of cooperation seem to be the way forward, with a "level playing field" operating
12 between these and private farmers, and the rapid development of efficient land and credit
13 markets.

14
15 Based on case studies in three Central European countries, Boyd (1991:125-6) concludes
16 that better agricultural performance in the socialist period depended on

17
18 (1) "A global environment that accurately identifies relative scarcities and makes these
19 the basis for productive decision-making (such as the market-socialist environment of
20 Yugoslavia, compared to the centrally planned environment of Poland);

21 (2) Internal farm (or enterprise) organization that promotes the effective collection,
22 interpretation and use of information on factor scarcities"; and

23 (3) Private production in Poland and Yugoslavia despite government policies that led to
24 significant neglect and exploitation.

25
26 In relation to technology, Boyd found it difficult to establish some "expected" relationships with
27 farm size, e.g. that a unimodal size distribution with most farms of medium size would be
28 more efficient than a bimodal one, and that land and labor productivities would reflect factor
29 scarcities between farms of different sizes. He found no evidence of greater dynamic
30 efficiency (disembodied technological change) on larger farms than on smaller ones, probably
31 because of the negative effects of both internal disorganization and poor central planning.
32 However, the large cooperative-style farms in Yugoslavia appeared to result in higher land
33 and labor productivities than private producers, possibly due to the better access of the
34 former to credit, which in turn allowed qualitatively different types of input.

35
36 As is well known, the socialization of agriculture in Poland was limited, with most farming
37 production remaining small-scale although some state farms were set up while collectivization
38 after 1956 affected the supply of inputs and, crucially, the distribution of most output. Unlike
39 Yugoslavia, where a similar semi-collectivization was enforced, the Polish government
40 continued to exercise strenuous but erratic central control over agriculture, in efforts to

1 improve performance by balancing and linking the private and socialized sectors of farming.
2 These efforts, which usually favored the larger-scale socialized sector, were seldom
3 successful, and led to inefficient use of new technologies and inputs in this sector, while
4 private producers were starved of both funds and certainty, with stagnation the usual result.

5
6 The establishment and then dissolution of an MTS system for farm machinery in several
7 socialist agricultures provides an illuminating illustration. As Medvedev (pp. 296 *et seq.*)
8 points out, "all machinery requires regular servicing and repairs", and providing the services
9 of this vital group of inputs is a major responsibility. Even large farms find it difficult to provide
10 the specialist labor and the spare parts that are necessary to maintain machine services,
11 especially at critical times in the season. While payment (from farm to MTS) may be made
12 dependent on performance (yields) in an effort to provide incentives, this can only be done for
13 harvesting, and the lack of a competitive market system for machinery servicing is a major
14 barrier to efficiently maintained equipment.

15 16 Adoption of new technology

17 In assessing the adoption of new technology in Northern Europe, the influences of climate
18 and geography cannot be ignored, particularly variation (uncertainty) in the former, and the
19 extent (distance) in the latter. Inadequate snow cover during the winter ruins autumn-sown
20 crops, while summer droughts similarly reduce yields. Much of the Soviet Union is subject to
21 dry winds and friable soils. On the other hand, rains turn fields to mud, and also spoil harvest
22 quality. Year-to-year variations can make a mockery of planning, and lead to errors in
23 planning, particularly serious if this is centralized.

24
25 In 1961, Khrushchev proposed a radical change to the support arrangements for Soviet
26 agriculture. Ministries of Agriculture - at both the All-Union and Union levels -were to be
27 relieved of the need to finance the *kolkhoz* and *sovkhoz* (*collective and state owned farm*
28 *respectively*), and concentrate on giving "scientific direction". Agricultural colleges were to be
29 transferred from the Ministry of Higher Education, and the ministries themselves were to
30 move away from Moscow and the Union capitals to more rural locations where model farms
31 could be established. Agricultural institutes and technical schools were to be relocated to
32 *sovkhoz* and teaching farms. Planning and operational oversight (input supplies, statistical
33 collection, procurement, etc.) were scattered amongst several ministries and agencies, often
34 on a non-territorial basis, with "anarchy and chaos" the inevitable result (Medvedev, p. 190).
35 Following the fall of Khrushchev in late 1964, most of these changes were reversed by
36 Brezhnev (who had considerable experience of agricultural administration, gained in Moldova)
37 and Kosygin.

38
39 A lesson to be learnt from the experience in Central and Eastern Europe is the importance of
40 transport, particularly in the case of livestock and livestock products (and some crop products)

with limited tolerance of storage and disturbance. The over-centralization of processing plants (as well as of input supply points) leads to major problems of delay and uncertainty, particularly in times of bad weather and in areas with poor road systems.

Post transition period

The political reforms that began in 1989 shifted the emphasis in agricultural policy toward developing an efficient, productive, sustainable export oriented agriculture based on comparative advantage instead of a focus on responding to basic production targets formulated by national plans with their goal of achieving self sufficiency. At the same time the role of agriculture in the post communist era declined relative to other sectors that began to achieve a relatively faster rate of development (OECD, 2001).

The reforms led to a substantial decline in agricultural production in the Central and Eastern European countries (CEECs)³. The gross agricultural output fell by between 15per cent and 30per cent for these countries between 1989 and 1992 although for both the Czech Republic and Slovenia that followed a brief initial increase of some 10per cent. The decline subsequently moderated for these countries during the remainder of the 1990s and even reversed for the Czech Republic, Poland, and Hungary. For Albania, by 1998, output had even reached higher than the 1989 level by over 10per cent annually (Macours and Swinnen, 2000)⁴.

Political reform in Russia and the other Newly Independent States (NIS) of the 1990s produced similar consequences for agricultural *productivity*. Estimates for Russian crop production indicate a drop of 8per cent in productivity overall between 1993 and 1998, while overall agricultural productivity rose in Russia and the Ukraine between 1992 and 1997 but only by 7per cent and 2per cent respectively (Liefert et al, 2002)⁵. The major changes in Russian agricultural production and trade following transition included a halving of the livestock inventory resulting in a reduction in imports of animal feed. Fertilizer, machinery, and fuel use also fell substantially, resulting in cuts in domestic grain yields and harvest levels. The same applied to the Ukraine as fertilizer output was switched to export supply (Liefert et al, 2002).

Reform affected agricultural inputs in varying ways and the variation differed depending on the country. The amount of land in agricultural use had initially remained constant although

³ Authors differ in the countries that are included under the rubric of the CEECs. Some authors restrict the definition to the ten countries that underwent accession to the EU between 2004 and 2007 namely Estonia, Latvia, Lithuania, Poland, Romania, Slovakia, Czech Republic, Hungary, Bulgaria, and Romania. Others include Albania, and the remaining Balkan states, but these are also referred to as the South East European Countries (SEEC). Most of the material in this section regards the CEECs as to the ten accession countries, unless other countries are referred to specifically.

⁴ Macours, K.; Swinnen, J.F.M; (2000): 'Causes of Output Decline in Economic Transition: The Case of Central and Eastern European Agriculture'; Journal of Comparative Economics (28), pp172-206

⁵ Liefert, W.; Osborne, S.; Trueblood, M.; Liefert, O.; (2002): 'Could the NIS Region become a major grain exporter?'; Agricultural Outlook, May (2002); ERS, USDA

1 there are estimates that there has been an increase in the amount of uncultivated land across
2 the region, which by certain estimates amount up to 30per cent in some countries (OECD,
3 2001)⁶. Input of fertilizer and use of machinery declined in the CEECs apart from in Poland
4 and Romania. In Hungary, Poland, the Czech Republic and Slovakia the agricultural labor
5 force declined but it increased in Romania, Bulgaria, Slovenia and Albania. The maximum
6 reduction was of nearly 13per cent in Hungary whilst the largest increase was of 2.4per cent
7 in Romania over the period between 1989 and 1995 (Macours and Swinnen, 2000).

8
9 The main aspects of reform in agriculture were price and trade liberalization, privatization of
10 land ownership, and the restructuring of farms. The process of land reform was slow but by
11 1995 75 percent of agricultural land in the CEEC had been privatized. The slowness of the
12 pace of ownership transfer inhibited the development of land markets which led to a
13 liquidation of productive assets including the slaughter of livestock and reduction in
14 investment (Macours and Swinnen, 2000). In addition to these aspects Jackson and Swinnen
15 (1995)⁷ identify the effect of extreme weather conditions, and the effect of over-reporting of
16 output that was prevalent before reform followed by the under-reporting that occurred during
17 and after transition. The lack of reliable agricultural statistics contributed to the policy makers'
18 difficulty in targeting effective support and is also commented on by Cartwright and Swain
19 (2006)⁸ particularly in relation to the identification of farms, the land holdings that would
20 qualify as farms and the size of the agricultural labor force. For example, they estimate that
21 when Eurostat rather than Polish definitions are used the labor force falls from 27% to 18% of
22 total Polish labor.

23
24 Privatization of agricultural land as well as upstream and downstream parts of the agro-food
25 chain has been completed by 2001. Land privatization has a highly fragmented ownership
26 structure across the region, although less so in the Czech Republic and Hungary as recipients
27 of the restitution of land title could exchange land for investment vouchers or cash.

28 Fragmentation is more pronounced in Bulgaria, Lithuania and Romania, but the operational
29 structure is less fragmented and most land is farmed in large viable units. In Poland and
30 Slovenia most of the land continues to be farmed as family type units as in pre-transition
31 period. The process of privatization has resulted in a bimodal structure in the region with both
32 small and large scale farms important especially in Bulgaria, Estonia, and Hungary. Large
33 scale farms are dominant in Czech Republic, and Slovakia and small and medium size farms
34 in Latvia, Lithuania, Poland, Romania, and Slovenia. In general, however, there are policies to
35 promote consolidation of holdings (OECD, 2001).

⁶ OECD (2001): 'Challenges for the Agro-food Sector in European Transition Countries'; OECD Observer, OECD

⁷ Jackson, M.; Swinnen, J.F.M.; (1995): 'A Statistical analysis and survey of the current situation of agriculture in the Central and Eastern European Countries'; Report for the European Commission, Leuven: Katholieke Universiteit, Leuven.

⁸ Cartwright, A; Swain, N. (2006); 'Finding Farmers in Eastern Europe: Some Issues'; Working Paper No 60. Rural Transition Series, Centre for Central and Eastern European Studies, University of Liverpool, UK

1 Farm restructuring involved the reallocation of land, labor and capital, and included
2 organizational reform such as a move from co-operatives to family farms. In the CEECs there
3 is now a wide range in the type of farm organization from family farms, private cooperatives,
4 joint stock companies, and part-time farmers. The restructuring has led to production
5 efficiency gains but also contributed to the short term production declines seen in the early
6 1990s. Restructuring was complicated by conditions in the industry pre-reform including the
7 type of farm organization, the degree of capital intensity, the extent of technology use and the
8 degree and speed by which these initial conditions were reformed.

10 Three broad stages can be identified in agricultural price policy reforms in the CEECs. These
11 began with the dismantling of administered pricing, production targets and state monopoly on
12 trade and the adoption of price and trade liberalization and limited intervention in agricultural
13 markets. This was followed by an ad hoc reapplication of controls on price and market
14 support and on trade restrictions. Thirdly, by the late 1990s and continuing up to accession in
15 2004, agricultural policy was dominated by preparations to align the agricultural sectors with
16 that of the European Union: to the CAP and to hygiene and welfare standards (OECD, 2001).
17 Structural reforms was directed to improve overall performance of the agro-food sector:
18 investment to improve market infrastructure, to modernize plant and equipment and
19 management inertia, consolidation of holdings to ensure viable farming units which depends
20 on a functioning land and land lease market (Cochrane, 2002)⁹.

22 EU support was provided for pre-accession restructuring (for the group of ten CEECs)
23 through various programs, with the Special Accession Programme for Agriculture and Rural
24 Development (SAPARD) being important in agriculture. SAPARD is a 7 year program which
25 started in 2000, and most of its funding programs (66 percent) were allocated to Poland,
26 Romania and Bulgaria.

28 In Russia and the NIS the reforms that were required were in farm-level organization and
29 management, and in the development of the physical and institutional infrastructure. Private
30 farming had not developed during the 1990s to any substantial degree, and land and rural
31 credit markets remained ineffective as a credible commercial legal system to protect property
32 and enforce contracts remained undeveloped (Virolainen, 2006)¹⁰. However in Russia there
33 were signs by the turn of the century that vertically integrated forms of organizations were
34 emerging. The USDA suggests that any productivity gains in Russia in the short to medium
35 term might come more from strengthening vertical ties for production and distribution rather
36 than from real technological or systemic change because of the increasing attractiveness for
37 investment that would result (Liefert et al, 2002).

⁹ Cochrane, N.; (2002): 'Pressures for Change in Eastern Europe's Livestock Sectors'; Agricultural Outlook (Jan-Feb, 2002); Economic Research Service (USDA)

¹⁰ Virolainen M. (2006); Working Paper 06/06; <http://tradeag.vitamib.com>

Virolainen (2006) notes that in Russia in particular there has been ‘a rapid, quite fundamental change in the principles for developing agricultural production’. The emphasis has shifted from the family farm to supporting large, commercial farm enterprises. These enterprises form so-called agroholding companies, consisting of either single farm enterprise or a collection of individual. These agroholdings may also be part of a larger industrial-economic grouping, such as the Alfa group, Interros, Lukoil, Metalinvest or Rusagro. These enterprises perform as vertically integrated enterprises ensuring raw material supply to group member companies, and may be used to ensure the supply of foodstuffs for the core company’s employees.

2B.2 Changes in consumption systems in NAE

Trends in consumption

In line with trends across the OECD, the share of overall consumer spending on essentials (food, clothing, energy) has declined in Europe; in the UK, it has halved in 40 years. In the UK, one pound in three spent on food is spent away from home, and in Ireland it is estimated that one Euro in every four is spent away from home (Henchion and McIntyre, 2004). Declining relative expenditure on food, and even food price deflation, is a major factor in the level of competition in food retail.

2B.2.1 Changes in the food retail sector in NAE

The giants of European food retail are Germany, France and the UK, based on their high populations and mature markets (Figure 2B.23).

[Insert Figure 2B.23: The European Retail Market: Modern Grocery Distribution, 2003 (EUR bn)]

The ownership structure of the biggest companies in European food retail (Table 2B.23) is varied. Carrefour (the world’s second biggest retailer) and Tesco are publicly held. Metro is publicly held, but with large proportion owned by founder Otto Beisheim, the Haniel group and the Schmidt-Ruthebeck family. Rewe is a cooperative owned by its 3000 retail members, while ITM Intermarché is a consortium of independent merchants. Food accounts for around three-quarters of sales for these companies, except Metro where the figure is closer to 50 percent.

[Insert Table 2B.12: Sales and market shares of top retailers—Western Europe]

In 2003, European food retailers accounted for 46 percent of all European retail sales. The food retail market in Europe is very mature, but the food retail sector has *increased* its share of the wider retail market in all but four of 19 countries (France, Spain, Sweden and Denmark) by 19 percent to €870bn between 1999 and 2003. Tesco’s sales rose by 54 percent and Wal-

1 Mart Europe by 32 percent thanks entirely to the Asda operation in the UK. *Non-food is the*
2 *driver of this supermarket growth*, since food sales are relatively stagnant.

3
4 There is a close relationship between per capita GDP and the penetration of 'modern' retail
5 (Figure 2B.24). But what is interesting from a European perspective are the outliers, such as
6 Italy with about 20 percent below predicted, and the UK, which is about 15 percent above
7 predicted by this relationship. Whether this phenomenon points to durable exceptions to the
8 rule based on cultural or policy differences, or simply to time lags in some countries, is not
9 currently clear.

10
11 [Insert Figure 2B.24 Penetration of large supermarkets around the world]

12
13 In central and eastern Europe, the penetration of large supermarket chains in the national
14 food retail markets is quickly approaching saturation. The EU average is 15 hypermarkets per
15 one million inhabitants. Hungary has 10 million inhabitants, and by the end of 2005 there will
16 be 98 hypermarkets in the country. Hypermarkets in Hungary now account for around a
17 quarter of the market.¹¹ Modern retailing already has an 18 percent share of the Russian
18 market.

19
20 While there is a general trend toward concentration in Europe, Dobson et al. (2001) point out
21 that the emerging structures of food retail are not always the same. These authors use a
22 typology of the *dominant firm* (when the market share of the top firm is >25 percent and at
23 least twice as high as the second ranked firm), the *duopoly*, the *asymmetric oligopoly*, the
24 *symmetric oligopoly*, and *unconcentrated* structure (when no firm has a market share >10
25 percent). In 1999 Italy was the only country ranked as 'unconcentrated', though this no longer
26 applies now that Coop Italia has a 12.5 percent share.

27
28 [Insert Table 2B.13: Market structure of retail in Western Europe, based on market shares of top 5 retailers]

29
30 The internationalization of retail in Europe has been, by comparison with other sectors, a
31 recent phenomenon. There is still quite a strong national characteristic to food retailing in
32 many Western European countries (Table 2B.14) though this (a) hides high levels of
33 international collaboration between firms in pan-European sourcing to increase buying power,
34 with buying groups especially strong in Scandinavia, and (b) the rise of the deep discounters
35 such as Aldi up the ranks of national players. Food retail in most CEE countries is dominated
36 by the multinational chains. The top 10 retailers in the Czech Republic, for example, are all
37 multinationals. Nevertheless, some domestic cooperatives, trade associations and retail
38 chains (such as COOP, CBA and Reál in Hungary, or VP Market in the Baltic countries) have
39 been able to hold their own against competition by international retailers.

11 Interfax Hungary Weekly Business Report, May 18, 2005.

Internationalization allows retailers to use their distribution systems for pan-European procurement. Tesco also exports e.g. Hungarian products under its private labels; Tesco announced last year it aimed to export HUF 1 billion in Hungarian goods in 2005, with increases of Hungarian goods to the Czech Republic, Slovakia and Poland. French-owned hypermarket Auchan also said recently it will increase the sale of Hungarian products outside Hungary's borders to HUF 5 billion in several years' time.

[Insert Table 2B.14: Top retailers across Europe—summary]

Own brand (private labels) are still rising in the European supermarket scene with an average 26percent market share in Western Europe (Table 2B.15). Growth is strong in parts of CEE—the share of private label products in Hungary was 15percent in 2003 and own-brand goods account for around 25 percent of the total Tesco revenue in Hungary. Tight price squeeze from supermarkets has been responsible for own brand manufacturers such as Northern Foods struggling with profitability.

[Insert Table 2B.15: Outlook for Private Label in Europe (% sales)]

'Trade spend' is another important feature of European retail, also known as '*marges arrières*' ('back margins'). Supermarkets have been able to use their gatekeeper position to make money on the buy side. This 'trade spend' for suppliers to secure business with supermarkets comprises reimbursements to the retailer for the range of products it carries and promotions it carries out, and includes supplier rebates, overrides¹², unilateral deductions from money due or even demands for ad hoc cash payments. According to the *Economist*¹³, "a typical big European retailer might extract the equivalent of 10 percent of its total revenues via trade spending."

Discounters are a growing part of the European food retail landscape with some notable exceptions such as the UK and Ireland (Figure 2B.25). Discounters are a huge part of the market in Germany—in 2003, Germany accounted for 43 percent of Western Europe's 32,500 discount stores.¹⁴ But deep discounting is also growing fast in France, where there is a growing emphasis on price.

[Insert Figure 2B.25: Value share of discounters as % of grocery sales]

Buying groups or 'international purchasing and marketing organizations' are means by which supermarket companies and consortia can increase their buyer power especially when negotiating with the big brand manufacturers. This is demonstrated by the GNX platform offering for auction contracts worth \$8bn. Associations between buying groups and the top 30

¹² A retrospectively paid discount or rebate usually related to the performance of the customer, for example achievement of a specified level of purchases over a period.

¹³ 15 May 2003

¹⁴ M+M PlanetRetail

retailers in Europe are common. The largest, EMD, has a 10.6 percent market share in Europe and a sales volume of EUR 950 million. Buying groups can have a significant impact on actual industry concentration. For instance in Hungary, from the Top-10 list SPAR and Metro form the buyer group METSPA with more than USD 1,800 million sales, and Cora (Delhaize group) and Csemege are part of the PROVERA buyer group. Because of the buying groups, Grievink (2003) estimates that in western Europe, only around 110 buying desks account for about 85 percent of the total retail food (not foodservice) sales of the western European countries.

Consolidation of retailers' supply base is creating conditions in which competition between suppliers creates its own pressure on producer prices. For example, between May and August 2004, the big three UK supermarket companies all announced rationalization of their milk supply, to two suppliers in the cases of Tesco and Sainsbury's, and one in the case of Asda.

2B.2.1.1 Concentration and trends at national level

Germany

Germany is famously the toughest market in Europe. Deep discounters have a huge share of the market, accounting for 27percent of modern grocery distribution sales, with that share around 50percent for some product areas such as milk. The position of discounters is supported by strict planning laws for 'big box' retailing, consumer perceptions of discounter private labels as good quality, and popularity across income groups. Data from *Lebensmittel Zeitung* give a CR4 of 66.7 (Table 2B.16), though M+M PlanetRetail (which use much the same data) gives a CR4 of 56.1

[Insert Table 2B.16: Concentration in the German grocery market]

France

[Insert Table 2B.17: Concentration in the French grocery market, 2003]

United Kingdom

The UK food retail market is highly concentrated (Table 2B.18) with a CR4 of 76.515.

[Insert Table 2B.18: Concentration in the UK grocery market, March 2005]

In the UK, the market for eating out of home was £38 billion in 2002, compared with £62 billion for household food expenditure—in other words, nearly 40percent of food expenditure is away from home (EFFF).

15 Though M+M PlanetRetail data give a CR4 measure of 49.3 in 2003

1 The rate of growth of the UK food market has slowed, and competition at the consumer side
2 is very intense, with a permanent price war. Many firms have struggled to remain competitive
3 and build critical mass in a market where market share is perceived to be key to success,
4 including Morrison's (following the acquisition of Safeway), Marks and Spencer, Sainsbury's
5 (only just starting to reverse a decline), and even Asda (part of Wal-Mart group) which has
6 recently reported disappointing figures. This turmoil is not limited to publicly owned
7 companies. The Co-operative Group is now searching for 'efficiencies' after poor sales figures
8 following a series of acquisitions. Only Tesco seems to have managed consistently strong
9 growth in market share at home and abroad (half of shelf space now overseas), profits and
10 shareholder value in this period of consolidation of the UK retail sector, while taking massive
11 chunks of business from clothing, electronics, financial service and other non-food sectors.
12 The craft retailer Waitrose has also prospered.

14 Primary producers and suppliers are feeling the squeeze on prices. In a recent survey of
15 farmers by Farmers Weekly magazine, a massive 95 percent of those questioned were
16 concerned about power imbalance between buyers and suppliers, saying that the government
17 must find ways to make trading relationships between retailers, processors and producers
18 more equitable. Caribbean banana producers have called the price war "perverse transfer of
19 wealth, by some of the supermarkets, from farmers and farm workers of developing countries
20 to the consumers of developed countries" and "anti-development and regressive"¹⁶.

22 Despite investigations by the Competition Commission in 2000 and again in 2003 (around the
23 Safeway takeover by Morrison's) and the resulting Supermarkets Code of Practice, and
24 subsequent review by the Office of Fair Trading, it is clear that consumer interests remain
25 dominant over those of suppliers in the eyes of the Office of Fair Trading. Indeed, the
26 situation in the UK around producer-supermarket trading can only be described as policy
27 paralysis.

29 The UK independent retail sector is in steep decline, with a 7.4 percent decline in the number
30 of corner shops in the last year alone. Industry watchers say 30,000 local shops - including
31 specialists such as butchers, bakers and greengrocers - will be lost in a decade.

32 The Netherlands

34 [Insert Table 2B.19: Concentration in the Dutch grocery market, 2003]

36 Spain

38 [Insert Table 2B.20: Concentration in the Spanish grocery market, 2003]

16 Interview of Bernard Cornibert, CEO of Windward Islands Banana Development and Exporting Company Limited, Eurofruit Magazines, April 2004

Italy

[Insert Table 2B.21: Concentration in the Italian grocery market, 2003]

Belgium

[Insert Table 2B.22: Concentration in the Belgian grocery market, 2003]

Ireland

As in the UK, supermarket sector is quite concentrated (Table 2B.23) and the independent retail sector is in a quite steep decline (Table 2B.24)

[Insert Table 2B.23: Concentration ratio for the top three grocery retailers in the Irish market]

[Insert Table 2B.24: Change in retail formats in Ireland, 1988-2002]

Romania

[Insert Table 2B.25: Top 5 grocery retailers in Romania, 2004]

Hungary

[Insert Table 2B.26: Top 5 retailers in Hungary, 2003]

Poland

[Insert Table 2B.27: Top 10 retailers in Poland, 2003]

North America

In North America, food retailing had a relatively slow pace of consolidation. A major wave of consolidation happened in the late 1990s, when Albertson's purchased American Stores, then the number three food retailer, and Kroger purchased Fred Meyer to create one of the first coast-to-coast supermarket chains.

By 2001, Kroger and Albertson's were number one and two in selling U.S. groceries. However, Wal-Mart, which until the early 1990s had never sold any groceries, became the number one grocery retailer in 2004, with about 15 percent of the U.S. grocery market. In Canada, Loblaw's is the number one grocer with about 39 percent of the Canadian market, with Sobey's competing for the number two position.

[Insert Table 2B.28: Food retailing in USA]

1 Currently, the major players In the United States food retailing are Kroger, Albertson's, Wal-
2 Mart, Safeway (U.S) and Ahold USA. Together these five supermarket chains account for
3 over 40% of food retail sales in the United States.¹⁷ By comparison, the top five food retailers
4 accounted for only 20% of food sales in 1993.¹⁸

5
6 When Wal-Mart entered the supermarket business in the mid-1990s, other stores were wary
7 because of the incredible logistics system and supplier pricing that Wal-Mart brought to the
8 business. More importantly, Wal-Mart's large size and market power caused concern as it
9 integrated backward in the food system by creating relationships with the dominant food chain
10 clusters. Wal-Mart is one of the first supermarkets to use case-ready meat in its stores. The
11 first such prepackaged beef came from Tyson, also supplying broilers. Farmland supplies
12 pork in the Midwest stores, although Wal-Mart was also scheduled to buy pork from
13 Smithfield's John Morrell.¹⁹ Smithfield was already supplying case-ready pork for Wal-Mart for
14 some of its East Coast stores early in 2000.²⁰

15
16 Kroger also has ties back to the production side of the food business. In March 1998, Kroger
17 began to sell case-ready beef and pork products in many of its southeastern stores. The
18 products sell under Kroger's own label, and are processed by Excel, a subsidiary of Cargill,
19 which also provides a similar service to National Grocers, Canada's largest supermarket
20 chain.²¹ This type of arrangement directly ties these retail stores to the Monsanto/Cargill food
21 chain cluster.

22 23 The Rise of Global Supermarkets

24 The end of the twentieth century saw the emergence of truly global food retailers. For
25 instance, Wal-Mart bought Wertkauf and Spar Handels in Germany, as well as Asda, Britain's
26 third largest-supermarket,²² operates in Argentina, Brazil, Canada, and Mexico, and is
27 involved in joint ventures in China and Korea.²³ The firm is the driver of change on the global
28 level. Carrefour and Promodes announced their merger as a way to cope with Wal-Mart on a
29 global scale.²⁴ The new firm has a strong presence in Latin America, where it is the number
30 one supermarket retailer in Brazil and Argentina. It is also the leading retailer in Taiwan,
31 France, Spain, Portugal, Greece and Belgium.²⁵ Reardon and Berdegúe (2002) document the
32 rapid consolidation of the Latin American supermarket industry by these transnational firms
33 and argue that development policy must adapt to the resulting exclusion of small farmers from
34 regional agrifood markets.

35

¹⁷ *Supermarket News* January 24, 2000.

¹⁸ *Nutrition Today*, May 2000.

¹⁹ Houston Chronicle, April 16, 2000.

²⁰ Agriculture.online, April 12, 2000.

²¹ Omaha World Herald, April 22, 2000.

²² New York Times, August 31, 1999.

²³ PR Newswire, March 3, 2000.

²⁴ New York Times, August 31, 1999.

²⁵ Business Week, September 13, 1999 and New York Times, August 31, 1999.

Another global firm is Ahold, which has about 28% of the Netherlands' food retail market. Sales in Latin America – Brazil, Argentina, Chile, Peru, Paraguay and Ecuador – generate about \$4.5 billion, while Portugal, Spain, Poland and the Czech Republic provide another \$2 billion, with about \$0.5 billion coming from the Far East.²⁶ Ahold also has a 50% stake in the ICA group, the number one food retailer in Sweden, with 35% market share, and number two in Norway, with almost 28% of the market.²⁷ Ahold is also the largest foreign retailer in China.²⁸ Some analysts predict there will be only six or so global food retailers in the near future, who will most likely be the drivers in the food chain clusters we have documented.²⁹

The significance of the changes in food retailing for production is in the restructuring of supply and distribution networks, and in the development of standards enforced by retailers (Reardon and Berdegue, 2002). While food manufacturers have sometimes embraced consolidation because it decreases transaction costs, it also distorts power in the chain and puts the food retailers "in a position to demand so much more from food processors." (Stanton 1999) Another result of restructuring is increasing retailer fees, some of which cover real costs but which are also used to generate an income stream that creates more gross profit for retailers (Federal Trade Commission 2000a:159). While retailer fees have been around since the 1970s in the U.S., their use seems to be increasing in the last five years. Manufacturers attributed the rising use of fees to greater retailer influence, while retailers attributed it to the increased cost of handling products (Federal Trade Commission 2000a).

In this arena of negotiated power between manufacturers and retailers, U.S. retailers seem to have an edge, with bigger chains charging higher retailer fees (Federal Trade Commission 2000b:108-109). As power shifts to the largest retailers, evidence from the UK indicates that profitability does also (Wrigley 1997). However, retailers are at the mercy of those manufacturers who have successful brands because branding is one way to create leverage with retailers. Retailers begin to develop one-on-one relationships with dominant food manufacturers who can service their far-flung systems. Moreover, retailers can start dictating terms to food manufacturers from their position of power at the point of consumption (Mehegan 1999).

Burch and Goss (1999:347) observe that the increasing consolidation of the retail sector "has had significant effects right through to the farm sector, transforming the demands placed on Australian growers and processors," a transformation that has shifted the degree to which producers can respond to changes within global relations of production." No matter how big Tyson or ConAgra, they must go through a food retailer to ultimately reach consumers. The

²⁶ Grocer, January 9, 1999.

²⁷ Nutrition Today, May 2000.

²⁸ Supermarket News, January 12, 1998.

²⁹ Financial Times, December 22, 1999, Grocer, January 9, 1999 and Supermarket News, September 18, 2000.

more consumers that are funneled through one entity (such as Wal-Mart), the more powerful that entity becomes in being able to set its own prices to pay suppliers.

The point is that there exist dynamic social relationships within the channel from production to consumption although the trend seems to be that it is more and more difficult for smaller entities in any one sector of the chain to compete effectively. The development of these anti-competitive practices in supply chain management concerns many observers, including those from business schools (Hildred and Pinto, 2002).

[Insert Table 2B.29: World's Top Grocery Retailers, 2004]

2B.2.2 Changes in food manufacturing and processing

The major food manufacturing countries in Western Europe are France, Germany the UK and Italy (Figure 2B.26). Meat, beverages, and dairy are the biggest sectors, comprising 20, 15 and 15 percent respectively of the value of production in 2001 totaling over EUR 600 billion (USDA-FAS, 2003). It is Europe's leading industrial sector and third-largest industrial employer.

[Insert Figure 2B.26: EU-25 Food and drink sector 2001, value of production (EUR billion) estimates]

The top manufacturers are listed in Table 2B.30. Concentration in the food manufacturing sector is relatively low.

[Insert Table 2B.30: Top European food manufacturers, ranked by turnover in 2002]

2B.2.4 Market segmentation

One of the main changes occurred in the last 50 years in NAE can be describe as a growing segmentation of the food markets and the emergence of food niche markets, such as PDO/PGI and TSG products in Europe (table 2B.35 and 2B.36), organic and fair trade production both in Europe and in North America. The process of market segmentation has been facilitated by the development of an increasing number of food standards and an articulated system of food labeling and certification.

2B.2.5 Rise of uniform quality standards for food manufacturing/retailing

Created by FAO and WHO, the Codex Alimentarius Commission has elaborated many international standards. According to the Codex Alimentarius definition, food safety is the assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use (Codex Alimentarius, 1997). ISO 9000 and ISO 14000 standards are implemented by 760,900 organizations in 154 countries (ISO, 2005).

[Insert Table 2B.31: Top ten countries for ISO 14001 certificates]

History of HACCP

The Codex Alimentarius Commission has adopted HACCP as the international standard for food safety. Today HACCP is being adopted world-wide, on the recommendation of the UN's Codex Committee. Under the EU food hygiene legislation, there are over a dozen measures covering specific products, an initiative to consolidate all hygiene legislation into one single text led to the implementation of EU Hygiene of Foodstuffs Regulations, 1998. The HACCP concept had its origin in the USA and stands for "Hazard Analysis Critical Control Point". The HACCP - Concept is now introduced by the Hygiene Rules 93/43/EEG in the production line of food in Europe. It bears the main ideas from the worldwide-accepted HACCP-System of the FAO/WHO Codex Alimentarius (OURFOOD, 2005).

Chronology of HACCP development (OURFOOD, 2005):

1959 - Development of the HACCP concept to assure one hundred percent safety of food to be used in space.

1971 - The HACCP system was published and documented in the USA.

1985 - The National Academy of Science (NAS) recommended the use of the system.

Worldwide the system became used and the FAO/WHO Codex Alimentarius (Food and Agriculture Organisation/World Health Organisation) cited the system in the Codex.

1993 - The European regulation 93/43 EG since 1993 provides the use of the system for the production of food.

Development of ISO 9000 (OURFOOD, 2005):

The ISO 9000 was first released in 1987, and was first accepted in Europe under the Number EN 29000 as an European norm in 1989. A first revision was published in 1994 and in 2000 the modification to ISO 9001:2000 was released. Since then only three main standards subsisted:

ISO 9000:2000: Includes a description approach to Quality Management as well as a revised vocabulary.

ISO 9001:2000: Includes the quality management system requirements.

ISO 9004:2000: Includes guidelines for performance improvement moving toward Total Quality Management.

The ISO 9001:1994, ISO 9002:1994 and ISO 9003:1994 family of standards have been consolidated into a single revised ISO 9001:2000 which contains a single quality management requirements standard that is applicable to all organizations, products and services.

[Insert Table 2B.32: Top ten countries for ISO 9001:2000 certificates]

The ISO-9001:2000 quality system aims to enhance customer satisfaction. This includes the processes for continual improvement of the quality system and the assurance of conformity to the customer and applicable regulatory requirements. In global business the certification according ISO 9000 turned out to be an imperative duty. The HACCP concept should be integrated in the quality system fulfilling hygiene regulations.

ISO 15161:2002 combines ISO 9001:2000 and HACCP. It is a useful model for the business improvement in the food industry.

[Insert Table 2B.33: Evolution of ISO 9000 certification in North America]

[Insert Table 2B.34: Evolution of ISO 9000 certification in some European countries]

ISO 22000:2005 - Food Safety Management System Standard

The International Organization for Standardization (ISO) has developed the ISO 22000:2005 Food Safety Management Systems Standard. ISO 22000:2005 is an international standard that defines the requirements of a food safety management system covering all organizations in the food chain from “farm to fork”, including catering and packaging companies. This standard has been developed to harmonize the growing number of national standards for food safety management. The standard combines generally recognized key elements to ensure food safety along the food chain including: interactive communication; system management; control of food safety hazards through pre-requisite programs and HACCP plans; and continual improvement and updating of the management system.

2B.2.6 Niche markets

Product differentiation has provided special niches in food markets. These markets are developed by granting protected trade marks/ names so that consumers would easily distinguish the special flavor or quality of niche products among similar commodities. Table 2B.35 provides information of Protected Designation of Origin (PDO) / Protected Geographical Indication (PGI) in the EU and Table 2B.36 on Traditional Speciality Guaranteed (TSG) in the EU.

[Insert Table 2B.35: Protected Designation of Origin (PDO) / Protected Geographical Indication (PGI) in EU]

[Insert Table 2B.36: Traditional Speciality Guaranteed (TSG) in EU]

The market for organic products

In 2004, the market value of organic products worldwide reached 27.8 billion US\$, (23.5 billion EUR), with a market growth of about 9%. The leading Regions were Europe, with a share of 49% and North America with a share of 47%. The three largest country markets were

1 USA (\$12.2 billion); Germany (\$4.2 billion) and the UK (\$1.9 billion) (Fibl, 2006)³⁰. In 2005,
2 the global market for organic products reached a value of 25.5 billion Euros, with the vast
3 majority of products being consumed in North America and Europe. For 2006, the value of
4 global markets is estimated to be at more than 30 billion Euros.

5
6 The distribution of the European organic market continues to broaden and deepen as more
7 consumers are attracted in more sectors and in more countries. In Germany a growing
8 number of conventional supermarkets are offering organic products and the number of
9 organic supermarkets continues to increase with 40 new organic supermarkets opening in
10 2004 alone. The UK market continues to show healthy growth, with much of the growth
11 occurring in non-supermarket channels like organic food shops, box schemes, and farmers
12 markets. A growing number of catering & food service companies are also offering organic
13 food. The Italian and French markets are the next most important in Europe, however growth
14 rates have slowed in these countries. A smaller market for organic food is found in Central &
15 Eastern Europe (CEE) with the region comprising less than three percent of European
16 revenues. The amount of organic farmland in CEE countries is rising, and the main products
17 consist of grains, seeds and herbs. Demand for organic products is growing in countries like
18 Czech Republic and Hungary, particularly in metropolitan areas.

19
20 The data for the European market is fragmented and reliable detailed country comparisons
21 are difficult to make because of the differences in data collection methods. However, FiBL
22 have estimated the data which contribute to the profile of the European market reflected in the
23 following tables for 2003 in which year the European market for organic food and beverages
24 amounted to € 11 billion: Market size (Table 2B.37), Development (Table 2B.38) and organic
25 food, sales in € million, share in % of total food sales, 2002-2003 (Table 2B.39).

26
27 **[Insert Table 2B.37: European Organic Market 2003]**

28
29 **[Insert Table 2B.38: EU market Countries clustered by stage of organic market development, 2001]**

30
31 **[Insert Table 2B.39: European markets for organic food, sales in €million, share in % of total food sales,**
32 **2002-2003]**

33
34 The North American market for organic products has reported the highest growth worldwide.
35 Organic food and drink sales in the US were estimated to have totaled approximately 14.5
36 billion USD in 2005. With healthy growth rates continuing, the region is expected to overtake
37 Europe and represent most global revenues in 2006. The driver for growth is the increase in
38 marketing and distribution channels, with traditional, dedicated organic retailers like Whole
39 Food Market and Wild Oats being joined by mainstream food multiples. Mainstream grocery

³⁰ Willer, Helga and Yussefi, Minou, Eds. (2006): *The World of Organic Agriculture - Statistics and Emerging Trends 2006*. International Federation of Organic Agriculture Movements (IFOAM), Bonn, Germany

retailers now comprise most organic food sales, and the range of products is expanding in supermarkets such as Safeway, Albertson's, Wal-Mart and Kroger. The Canadian market is also reporting high market growth.

Demand in North America has become so high that local producers are having difficulty in matching supply and organic products are being imported from across the world e.g. organic seeds and grains are coming in from Europe and Asia; organic herbs & spices from Latin America and Asia; organic beef is imported from Australia and Latin America. Large food companies dominate almost every sector with companies such as Dean Food and General Mills active in the market. North America has organic food companies such as Hain Celestial, Sun Opta, Whole Food Market and Planet Organic listed on the stock exchange (FiBI, 2006)

The market for organic products is also growing, not only in Europe and North America (which are the major markets), but also in many other countries, including several developing countries. Angela B. Caudle, IFOAM Executive Director, emphasizes "as markets for organic products continue to develop throughout the world, including in key markets outside of Europe and North America, such as Brazil and the Middle East, the benefits of organic agricultural systems on a large scale will become increasingly evident."

Fair-trade

Fair trade in Europe

In 2003, the global Fair Trade sales were to over \$895m and the sales could increase by a factor of 20 or more in the next few years (Nicholls and Opal, 2004). Half the UK population is now aware of Fair Trade and there are similar figures for other European countries. Sales of Fair trade products in Europe are growing remarkably in several countries, but are largely stagnant in other countries. In 2004 sales grew of 102% in France, 50% in Belgium and 60% in Italy (Wills, 2005). Information of Fair Trade in Europe 2003-2004 is given in Table 2B.40 and the biggest FT importers in Europe in Table 2B.41. Data on FT marketing retail outlets in Europe is given in table 2B.42, FT turnover in 2B.43.

[Insert Table 2B.40: Fair Trade in Europe – data 2003-2004]

[Insert Table 2B.41: Biggest Fair Trade importers in Europe]

[Insert Table 2B.42: Fair Trade in Europe – data 2005]

[Insert Table 2B.43: Fair Trade in Europe – additional data 2005]

Fair Trade in the U.S

The findings of the 2005 Fair Trade Trends Report (The Fair Trade Foundation, 2005) clearly demonstrate that the Fair Trade movement has continued to grow rapidly over the past five years (table 2B.44). In 2003, total Fair Trade sales in North America including Mexico

reached \$291.75 million, a 53 percent increase over 2002. The US Fair Trade sales currently represent a potentially huge market for the initiative. US Fair Trade market is the largest single national market in the world after UK and the sales are increasing remarkably (table 2B.45).

[Insert Table 2B.44: US retail outlets selling labeled Fair Trade products]

[Insert Table 2B.45: Total Gross Sales in North America (US and Mexico) 2001- 2003]

Fair Trade Coffee

In 2002, FLO estimated the income benefit to Fairtrade producers at £21m, of which £17m was attributable to sales of Fairtrade certified coffee. TransFair USA estimated that, in five years of activity in the USA, Fair Trade has returned over £16.8m to coffee farmers in developing countries above what they would have received in the conventional market (TransFair USA, 2004). Fair Trade coffee sales vary considerably amongst different European countries, (table 2B.46). It can be argued that while coffee sales keep increasing in some countries, in general in Europe are largely stagnant (2B.47).

[Insert Table 2B.46: Market shares of FT labeled coffee (%) in Europe, year 2005]

[Insert Table 2B.47: European Market for Fair Trade coffee]

By contrast, in North America, strong national campaigns have allowed a significant growth and it is likely that also in US and Canada FT coffee sales will reach a market ceiling similar to that in Europe (Table 2B.48, Murray et al., 2003:15). Fair Trade Certified coffee is now the fastest-growing segment of the US specialty coffee market (table 2B.49). The retail value of TransFair USA certified coffee increased by 59% in 2003 for a total of \$208 million and by 77% in 2004 for a total of \$369 million. (Table 2B.50, The Fair Trade Foundation, 2005).

[Insert Table 2B.48: World Fair Trade Coffee Pounds Certified by Country]

[Insert Table 2B.49: Total Gross Sales of Transfair USA (Coffee)]

[Insert Table 2B.50: Fair Trade coffee, US market share]

Fair Trade Bananas

Europe.

Fair Trade bananas were introduced in Europe by Max Havelaar in 1996. Since then, Fair Trade bananas had grown 14,655 tons by 1998 (data FLO in Murray and Reynolds, 2000). They have captured unprecedented market shares; sales have risen by over 25% per year since 1999, reaching a market share of over 45% in Switzerland (Table 2B.51, FINE, 2006).

[Insert Table 2B.51: Market shares of FT labeled bananas (%) in Europe, year 2005]

United States.

Alternatively traded bananas have emerged in US in different way compared to Europe. In US the NGO Rainforest Alliance has certified bananas under its ECO-OK and 'Better bananas' program in 1999. Instead of building an alternative trade that challenges the power of bananas multinational corporations, this NGO has fostered a close collaboration with those companies (Murray and Raynolds, 2000). Transfair USA began certifying Fair trade bananas only in January 2004, data of market shares for FT labeled bananas are not available.

2B.2.7 Changes in diet/consumption, nutritional aspects and social consequences

The general context in NAE is that of a contrasted situation between the food shortage post WWII, especially in Europe, and the present situation of affluence and surplus in North America and Europe. This trend is attested by a number of key indicators of food provision (Food, chapter 8 in Millennium Ecosystem Assessment, based on FAOSTAT 2004 data). The average food production per capita in the world increased from 1961 to 2003 by around 25%. There were huge inequities between industrial and developing countries. This was accompanied by falling food prices, as there was a strong decline in the relative importance of food within total consumption expenditure (from above 40% after WWII to 12-20% in Europe in 1999, EUROSTAT 2001 and to 10% in the United States in 1996, USDA 2006).

[Insert Table 2B.52: Food budget shares for some NAE countries]

According to 2001 estimates, 13 per cent of the household budget in the EU15 was spent on food and non-alcoholic beverages, but the share of the budget spent on food fell between 1995 and 2001, mainly as a result of increasing available household income. Logically, the share varies with GDP per head: the lower GDP per head of a country, the higher the share of money spent on food. For the EU25, factors such as culture, tradition, household composition, income and degree of urbanization can influence habits in each member state (Partos, 2005). "The enlargement of the EU with 10 new member states has made these variations even more prominent than before" (USDA, 2005)

Consumer patterns across the enlarged EU reflect income differences but also the availability of goods and services. In the 1990's, the share of the household budget spent on housing increased in the EU-15 while the share spent on food dropped proportionally (Partos, 2005). This is not the case in the new member states where food is still the largest expenditure, largely due to lower income levels.

In 2005, the consumption of food and drink represented on average 16 % of total consumption expenditure per person in the EU-15 countries, and 27 % in the new Member States (EEA, 2005). Food and drink used to account for the largest share of household

consumption, before being gradually overtaken by other necessities such as housing, transport and leisure.

[Insert Table 2B.53: Food and non-alcoholic beverages, at current prices: % of total household consumption expenditure]

[Insert Table 2B.54: Household Consumption Expenditure in the EU-25 in 2003 (%)]

[Insert Table 2B.55: Household consumption expenditure in the EU-25 in 2002: food and non-alcoholic drinks (in % of total household consumption expenditure)]

Significant differences persist among member states. The lowest share of expenditure is found in the United Kingdom (9.7%) and the highest in Portugal (18.5%). The share of food and drinks in household expenses remains important in the new member states with an average of 22% against 12% in the EU 15 (CIIA, 2005).

Consumers' habits vary substantially among the 25 Member States. Factors such as culture, tradition, household composition, income and degree of urbanization can influence habits in each country. The accession of the 10 new Member States has made the differences even more apparent than before. The highest share of food expenditure is found in the new Member States where the budget spent on food varies from 16% to 28% (CIIA, 2006). However, the share of citizens' total expenditure on food is projected to continue decreasing. Total food consumption expenditure in the EU-15 is projected to increase by 17 % between 2000 and 2020, while in the same period total household expenditure could increase by 57 % (EEA, 2005).

[Insert Table 2B.56: Expenditure and calorie contribution of different food products in EU and US]

[Insert Table 2B.57: Proportions of expenditures in real values (average of 1995 and 1999)]

[Insert Table 2B.58: Index of relative price (GDP index for each country, 100)]

2B.2.7.1 Changes in food provision and food nutrients

Increased food availability was made possible by increases in production and labor productivity in all sectors of the agricultural and food chains (see data provided in other parts of chapter 2B.2). AKST has played a major role in this phenomenon, as intensive livestock and crop systems were developed in order to meet quantitative food demand.

These changes in food provision resulted in increased amounts of food calories, as well as protein and fats available for consumption in Europe and North America (Tables 2B.59 and 2B.60).

[Insert Table 2B.59: NAE food supply: energy, protein and fats per capita per day]

[Insert Table 2B.60: NAE food supply: energy, protein and fats per capita per day, standardized to Western Europe values in 1961 (= 100)]

Available food calories have increased in the range of 18-26 % in Western Europe and USA between 1961 and 2003, presently reaching values of 3500 to 3900 calories per capita per day. During the same period, protein supply has increased by 22-25 % and fat supply by 29-41 %. Increases were much more modest in Eastern Europe, as food calories increased by only 3 % and protein by 4 % between 1961 and 2003. In contrast, fat supply increased considerably, i.e. by 37 % in the same period.

Noteworthy is the amount of calories provided by lipids in the diet, which is presently around 40 % in Western Europe and America, but 30 % in Eastern Europe (derived from data presented in Table 2B.59). Another feature is the change in the percentage of calories or nutrients derived from animal vs. plant products, for which data are shown in Table 2B.61 for Western and Eastern Europe. Whereas the percentage of calories from animal origin slightly increased between 1961 and 2003, the percentage of proteins from animal origin increased more dramatically (reaching 60 % in 2003 for Western Europe). In contrast, animal fats in the diet actually decreased over the same period, especially in Eastern Europe.

[Insert Table 2B.61: NAE food supply: % of energy, protein and fats from animal vs. plant origin]

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