

3 – Scenar 2020 Baseline (Reference) Scenario and Alternative Scenarios

The number of scenarios is limited to three: baseline (the reference scenario), liberalisation and regionalisation (schematically presented in Table 3.1). Section 3.1 specifies the assumptions used for scenario building. Section 3.2 presents the baseline (reference) scenario and the two alternative scenarios. The two counterfactual scenarios provide a contrast in order to evaluate the range of possible consequences associated with policy options likely to be considered over the coming years. Section 3.3 discusses some uncertainties with regard to the scenario assumptions.

3.1 Assumptions for scenario building

An assumption that has guided the preparation of the scenario study is that there are two levels of drivers that will influence scenario building. The first level is a set of *exogenous* drivers; these are drivers that are not directly influenced by policies, or at least not in the Scenar time horizon (that is, up to 2020). As presented in Table 2.13, they are population growth, macro-economic growth, consumer preferences, agri-technology, environmental conditions and world markets⁴⁵. The second level is a set of *policy-related* drivers, and these will certainly have a discernable effect within the Scenar time horizon. They are EU agricultural policies, enlargement decisions and implementation, WTO and other international agreements and environmental policy.

Several choices have been made for the development and analysis of scenarios. The first is to have a baseline scenario that is based on the exogenous drivers. The second is that the policy-related drivers are then coupled to the baseline scenario in three iterations. The first iteration is the *baseline (reference) scenario*, in which current policies are considered to continue into the future, with modifications over time that are reasonably certain to happen according to the current political situation. The second iteration is a *regionalisation scenario*, in which there is a sustained policy preference to promote regional economic strength and social welfare; to some extent this is also an emphasis on the maximum degree of support for agricultural supply that is possible under the current, and likely, WTO framework. The third iteration is a *liberalisation scenario*, in which policy intervention in the economy – and in social welfare, including environmental protection – is reduced to the minimum that would be socially acceptable.

These three scenarios are not innovative, but they have two merits. The first is that, because of the substantial database that has been established, they are very thoroughly examined through the modelling and subsequent SWOT analysis. Therefore, the effects of a plausible range of policy options can be well documented. The second follows from the first, and that is the capacity to do a sensitivity analysis with regard to very precise policy modifications. In this regard, a third choice with regard to scenario development and analysis is that sensitivity

⁴⁵ World markets are partly endogenous in this study as we use a global economy-wide model in which world markets are dependent on macro-economic and population developments, preferences shifts, technological change and policy changes.

analysis takes place with regard to manipulation of the first level, or exogenous, drivers. The intention of Scenar 2020 is to demonstrate possible effects of policy responses, not to propose policy modifications or to suggest new policies. As a consequence, counterfactual situations are tested through the types of policy decisions that are incorporated within the sensitivity analyses.

3.2 Overview of the scenarios

This section describes the scenario assumptions of the three scenarios: baseline (reference), regionalisation and liberalisation. A summary of the basic scenario assumptions with regard to the exogenous drivers and policy related drivers is found in Table 3.1. The general outline of the policy measures for the Common Agricultural Policy (CAP) retained in the scenario building is given in Table 3.2.

BASELINE SCENARIO

General approach

It has been stated several times in this study that the fundamental assumption made in Scenar 2020 is that there are two types of drivers governing the development of the economic, social and environmental conditions in Europe, and elsewhere in the world. The first are those drivers that operate basically independently of policy-making, or over which policy-making will have an influence on fairly long time scales. Two examples are population growth and climate change. This is not to say that policy-making will not have an impact, but the impact will not take place in an immediate manner. The second type of drivers are those which are the instruments of policy-making, and which will have immediate or medium term implementation effects (on a 5-10 year horizon), and which of course may set in motion derived effects that will last for quite some time. The farm-level structural change induced by the Guidance measures of the Common Agricultural Policy have led to land re-allocation and field drainage on an immense scale, and this has altered the landscape and the biodiversity over large areas of rural Europe.

In order to highlight the possible impact of policy decisions, the general approach to constructing scenarios in Scenar 2020 has been to keep *constant* all exogenous drivers or assumptions *except* those relating to policy-making. So the world-view portrayed for the baseline scenario is the same which applies to the regionalisation and the liberalisation scenarios. The policy measures, once again, are what are modified in the regionalisation and the liberalisation scenarios. These are placed within a global context which gives them their sense.

Table 3.1: Scenario assumptions.

(a) Based on the exogenous drivers

Assumptions	Demographics	Macro-economic growth	Consumer preferences	Agri-technology	World Markets
<i>Baseline</i>	Major population trends as observed in the past	Moderate growth as seen in the trends; Increasing trend for labour market liberalisation	More demand for value added and increasing absolute spending per capita; Consumption of organic and regional food as observed in the past	Continuous trends in cost saving technical progress; Biotechnology; GMO	Outcome depends on other exogenous drivers. Trends in agri-markets, generally, as observed in OECD/FAPRI studies. Change from these trends due to different assumptions on exogenous and policy-related drivers.

(b) Based on the policy-related drivers

Assumptions	CAP			Biofuels	Enlargement	WTO and other international agreements	Environmental policies impact on agriculture
	Market policies	Direct payments	Rural development policy				
<i>Baseline</i>	Balanced markets, i.e. keeping public intervention stocks at 1 to 2% of domestic consumption; if stocks are too high support prices will be decreased	Financial discipline and 25% modulation	Taking into account the new financial perspective	Continuation of EU Biofuels Strategy	EU-25 plus the accession of Bulgaria, Romania, Turkey and the Western Balkans	EU offer	Continuation of existing environmental legislation
<i>Regionalisation</i>	Existing CAP	Financial discipline and 5% modulation	Significant increase in funding of rural development through all EAFRD axes	Higher policy support to produce biofuels	Baseline	No WTO agreement / bilateral approach	Reinforcement of environmental legislation
<i>Liberalisation</i>	No internal support policies	Removing direct agricultural payments	Rural development is funded according to EAFRD provisions: decrease in funding of all EAFRD axes	No per hectare subsidies for biofuels	Baseline	Removing import tariffs	Partial withdrawal of environmental legislation

Table 3.2: Policy Measures for the CAP.

(a) Details about Market Policies

	Baseline	Regionalisation	Liberalisation
• Phasing out of intervention	Current system of intervention	Current system of intervention	No more intervention
• Level of intervention price	Adjustment to balance markets	Current level	No intervention
• Regulations for quota products (milk, sugar)	Reform of the sugar MO Further reforms which might results in non-binding quotas	Current quota regulations	No quota regulations
• Cut of quota, reduction of support prices, compensation through direct payments	With partial compensation	No cut in quota	No compensation
• Quota level for new members (Turkey, Croatia)	Introduction of quotas Reference period: 2010-12	Introduction of quotas	No quota regulations
• Changes in consumption subsidies (skimmed milk powder (SMP), Butter)	Reduction of consumption subsidies	Consumption subsidies constant at current level	No consumption subsidies
• Changes in the per hectare support for biofuels	Constant current level of support	Higher per hectare support (+ 50%)	No per hectare support

(b) Details about Trade Policies

	Baseline	Regionalisation	Liberalisation
• ad valorem tariffs	EU offer, see also Table 3.3.	Constant level (No WTO agreement)	Removing of tariffs
• Specific tariffs	EU offer see also Table 3.3.	Constant level (No WTO agreement)	Removing of tariffs
• Export subsidies	EU offer see also Table 3.3.	Constant level (No WTO agreement)	Phasing out export subsidies
• Increase in existing TRQs	Constant level of current TRQ	Increase in TRQ	No TRQ due to full liberalisation
• Introduction of new TRQs	No new TRQ	Introduction of new TRQs under Mercosur, ACP and Euromed	No TRQ due to full liberalisation

(c) Details about direct payments:

	Baseline	Regionalisation	Liberalisation
• Development of national envelopes	Constant in nominal terms	Constant in nominal terms	Complete reduction
• Modulation rates	Increased to 25%	5%, as decided in 2003	-
• Distribution of funds from modulation	50% within the MS 50% reallocation among MS	50% within the MS 50% reallocation among MS	-
• Full decoupling for all partial decoupled payments	Full decoupling	Maximum amount of coupling	-
• Application of the Single Farm Payment 1. EU-10: 2009 2. BG&RO: 2012	As planned	SAPS with some 'recoupling' options	-
• Development of obligatory set aside rates	Current situation	Increase to max. 15% dependent on results	No obligatory Set aside
• Direct payment in Turkey and Western Balkans	As in EU-12	See baseline	No introduction of direct payments
• Phasing-in of direct payments in Turkey and Western Balkans	As in EU-12	See baseline	No introduction of direct payments
• National top-ups in Turkey and Western Balkans	As in EU-12	See baseline	No introduction of direct payments

(d) Details about rural development policies:

	Baseline	Regionalisation	Liberalisation
• 2 nd pillar measures	New financial perspective	Increase in funds for rural development	Rural development funded as per EAFRD provisions

Global developments

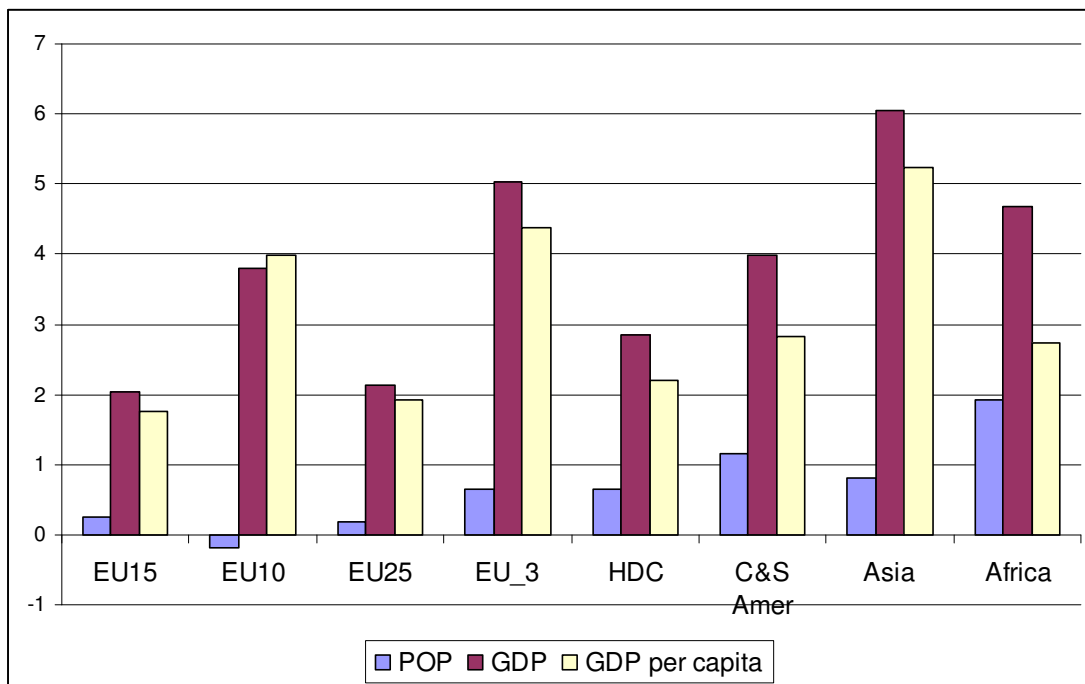
Macro economic and demographic growth are important drivers of demand for agricultural products. Projections for population and GDP for the EU Member States are taken from a study of the Economic Policy Committee of the European Commission called “The 2005 EPC projection of age-related expenditure: agreed underlying assumptions and projections methodologies, 2005”. The projections for the rest of the world are based on assumptions used in the OECD and USDA agricultural Outlooks.

Global demographic trends

Expected population developments in period 2005-2020:

- The world’s population growth will fall from 1.4% in the 1990-2003 period to about 1% in the coming ten years. This is mainly due to births or fertility rates, which decline and are expected to continue to do so.
- Almost all annual population growth will occur in low and middle income countries, whose population growth rates are much higher than those in high income countries.
- Europe’s share in world population has declined sharply and is projected to decline during the 21st century.
- Population growth in Europe is very low (0.3% yearly for EU-15) or slightly negative (-0.2% for EU-10)

Figure 3.1: Population, GDP and GDP per capita yearly growth rates (2005-2020).



Global GDP and GDP per capita (endogenous)

- Robust economic growth is expected over the coming period in almost all regions of the world in the baseline scenario (see Figure 3.1).
- Economic growth will be considerably higher for most of the transitional and developing countries than for the EU-15, the United States and Japan, in particular for Brazil, China, India and the new EU Member States. Incomes in Europe are expected to increase slightly over the coming years.
- Income growth in Europe is about 2% yearly for EU-15 and 3.8% yearly for EU-10
- The process of transition continues in the accession countries (EU-10). Income growth is high (about 2 times that of the EU-15). The level of income is less than 50% of that of the EU-15 and there is ongoing structural change in their economies and especially in agriculture. Economic growth accelerates in the EU-10 after accession. Structural change will be supported by structural funds

An exchange rate of \$1.20 to the Euro is maintained over the long-term.

Consumer preferences

Due to higher income levels in formerly low and middle-income countries, more money is spent on purchasing food. This not only leads to a higher consumption of meat, dairy products, fish, vegetables and fruit. It also boosts the demand for processed food, convenience products, etc., as well as for regional food (like PDA and PDO). In the richer countries, the demand for regional and organic food grows significantly.

Agricultural technology

Due to climatic change, crop yields increase in many European areas, but water scarcity causes significant problems in southern Europe. This leads to reductions in crop yield, decreases in irrigated areas and accelerated land abandonment. Projections for yield developments are taken from the EU, OECD and USDA agricultural Outlooks.

Global policies

A WTO agreement is achieved according to the EU proposal. It is important to notice that the WTO agreements (EU proposal in baseline) are implemented for all regions in the world (multilaterally) and for all products (agriculture, industrial and services). Therefore also other regions than only the EU lower their tariffs and export subsidies.

Table 3.3: EU proposal in Doha Development Round.

Export competition	<ul style="list-style-type: none"> - 100 % reduction of export subsidies by 2013 - parallel elimination of all other forms of trade distorting export support
Domestic support	<ul style="list-style-type: none"> - a three band reduction for AMS (amber box support) under which the EU (and possibly Japan) would fall into the upper tier (committing it to a 70 % reduction in AMS), the U.S would fall into the second (requiring it to cut its AMS by 60 %), and the remainder of WTO members into a third band that would be subject to a 50% reduction. - an 80 % reduction in <i>de minimis</i> support for all developed countries (in both product and non-product specific support) from the 5 % level of production value currently allowed.
Market access	<ul style="list-style-type: none"> - reduction of agricultural import tariff: On the basis of ad valorem equivalents (AVEs), the EU proposes an approach under which tariffs would be cut on the basis of the number of thresholds (30, 60, 90). Four different bands with linear cuts of 35%, 45%, 50% and 60% apply to both developed and developing countries; the latter apply 2/3 the level of linear tariff cuts and thresholds. - treatment of sensitive products to provide access consistent with FA - a limited number of products be treated as “sensitive,” which it proposes achieving, in line with the FA, by combining the effect of an expanded tariff rate quota (TRQ) with a lower tariff cut, the objective being to offer substantial market access for a limited number of products, but at a lower rate than the full tariff cut would imply.

EU policies

The EU-27 will be extended with the accession of Turkey and the Western Balkans.

The CAP undergoes a number of changes but the CAP is kept in place as an instrument to accompany rural development, although somewhat restricted because of financial discipline. Because of the WTO agreement, EU trade policies are altered in line with the EU offer. The direct payments are continued, but are gradually reduced in line with the financial discipline and a modulation rate of 25%. As for market policies, 1-2% of domestic consumption is kept in stocks in order to maintain balanced markets.

The EU Biofuels Strategy will be continued and it stimulates demand for bio-ethanol and bio-diesel, and as transformation capacity develops in Europe so does demand in native, rather than imported, biofuels.

The environmental legislation, as developed in the EU between 1985 and 2005 (i.e., Nitrate Directive, Water Framework Directive, Bird and Habitat Directives, National Emission Ceilings Directive, pesticide policy, etc.) is kept in place and refined, and a Soils Directive is introduced. Some difficulty is experienced from 2010 in maintaining the Natura 2000 network in face of set-aside conversion to biofuels, and later on by general harvesting of biomass for transformation into energy.

REGIONALISATION SCENARIO

Regionalisation is a policy framework which refers to the possibility that, in the absence of a successful conclusion of the Doha Round, then not only will further bilateral and multi-lateral negotiations will continue but also at the same time more encouragement will be given to promoting the production of commodities in the internal market.

Global policies

No WTO agreement is reached, neither for agriculture nor for other trade aspects.

EU policies

The EU-27 will be extended with the accession of Turkey and the Western Balkans.

The CAP is largely kept in place. In the period 2007-2013 the direct payments are reduced by 5% because of modulation, and the money is shifted to rural development. The funds allocated for the RDP are mainly spent in axes 1 and 2.

As there is no WTO agreement import tariffs are kept in place. In stead of multilateral agreements a few bilateral agreements will be established based on on-going negotiations. Considering that these negotiations are already underway, with stated deadlines in some cases, they could have been integrated into the reference scenario. However, for didactic reasons, we assess the impact of enhanced regional trade agreements under the regional scenario, to show the difference with the reference scenario (where multilateral trade effects dominate) and the “across the board” liberalisation in the liberalisation scenario. In the regionalisation scenario we assume that bilateral agreements will be reached with Mercosur, Mediterranean countries, Africa, Caribbean and the Pacific and South Africa.

The EU Biofuels Strategy strongly encourages demand for bio-ethanol and bio-diesel, and the transformation capacity is encouraged in Europe by fiscal measures; this sharply accelerates demand in native, rather than imported, biofuels. Land originally in set-aside begins to be allocated to maize and oilseeds, but resistance occurred in areas having high landscape value – therefore important for other sectors, notably

tourism. Bio-chemistry makes substantial progress in relation to petro-chemistry, as bio-based materials are substituted in numerous applications.

The environmental legislation, as developed in the EU between 1985 and 2005 (i.e., Nitrate Directive, Water Framework Directive, Bird and Habitat Directives, National Emissions Ceilings Directive, pesticide policy, etc.) is kept in place and reinforced, and a Soils Directive is introduced.

LIBERALISATION SCENARIO

Liberalisation – also a policy framework – implies that the current context of moving towards more open markets at the international level will be strengthened. In this scenario, all forms of market and trade policies and income support will be abolished in the EU and the rest of the world.

Global policies

World trade in agriculture, manufacturing and services will be fully liberalised by the abolitions of all export subsidies and import tariffs.

EU policies

The EU-27 will be extended with the accession of Turkey and the Western Balkans.

After 2013, the 1st Pillar of the CAP is completely dismantled in a couple of years. By 2018 the agricultural markets are fully liberalised and all internal support policies and direct payments are removed.

The EU Biofuels Strategy is reduced and there will be less support for biofuels. All per hectare subsidies for biofuels will be abolished.

The environmental legislation, as developed in the EU between 1985 and 2005 (i.e., Nitrates Directive, Water Framework Directive, Bird and Habitat Directives, National Emissions Ceiling Directive, pesticide policy, etc.), is partly withdrawn or modified in order to keep Europe's agriculture competitive in the world market.

The rural development policies are funded according to EAFRD provisions: leading to a decrease in funding of all EAFRD axes.

3.3 Specific variable considerations for scenarios

There are several possibilities for pronounced deviations from the baseline scenario; these are drivers that have already been recognised: biofuels, water supply, demography, agro-technology, world markets for agricultural commodities, animal disease and, of course, the public financial support given to the agricultural sector.

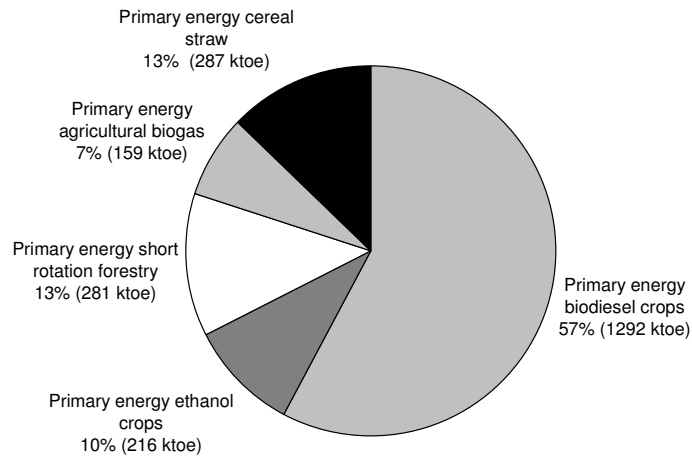
BIOENERGY

The development of bioenergy is underpinned both by the increasingly tight supply of crude oil and, as a consequence, by EU policy⁴⁶. According to the OECD (2006), meeting only 10% of current EU energy requirements for transport through biofuels that are sourced domestically would be equivalent to the use of 43% of the actual EU production of appropriate feedstocks: cereals, oilseeds and sugar beet. The implications for the world and domestic market have not yet been modelled, and possible consequences would include a shift in allocation for arable land use from others, such as set aside or fallow land areas and forest. There is an additional complication, which is the development of lignocellulosic technology. Once this technology is being used on a commercial scale, then the price advantage of alternative feedstocks – grasses, coppiced wood, biodegradable wastes of all sorts – will shift the sourcing away from the feedstocks mentioned previously. The shift is likely to be rapid, as of 2015, and therefore the implications of such a movement on markets and land allocations need to be taken into account when planning for the initial development of current feedstocks (cereals, oilseeds and sugar beet). An additional way of using biomass is as source of thermal energy, applied to electricity generation and heating, or indirectly as biogas. There is, therefore, a substantial potential for using crops of biomass derived from crops that can have an influence on land use, and the implications of this may be an inflection in the rate of decline of land area devoted to agriculture, or a reversal of this tendency altogether. Figure 3.1 illustrates the possible variety of agricultural source material and use as renewable energy⁴⁷.

⁴⁶ This latter aspect is presented in sub-section 3.1.2.

⁴⁷ Two recent EEA reports concerning bioenergy and biofuels are of relevance to Scenar2020:
 - European Environment Outlook (http://reports.eea.europa.eu/eea_report_2005_4/en;
<http://scenarios.ewindows.eu.org/reports/fo1949029>). It provided the forward-looking component to *The European Environment - State and Outlook 2005*, and gives much more details on agricultural projections done with the CAPSIM model, including the share of biofuels in the agricultural sector.
 - How much bioenergy can Europe produce without harming the environment?
 (http://reports.eea.europa.eu/eea_report_2006_7/en; (http://reports.eea.europa.eu/briefing_2005_2/en)).
 This study made use of the EFI and Green-X models.

Figure 3.1: Production of renewable energy type from agricultural sources in 2003 (EU-15).



Source: IRENA (2004)

WATER SUPPLY

The major natural resource parameters conditioning agricultural land use are soil quality and water supply, which – in addition to climatic factors such as temperature, rain fall and storm patterns – determine the agricultural potential of a region. The soil quality issue is not as volatile as the water supply issue, and can be managed by good agricultural practice; there is ample encouragement possible through the cross-compliance principle associated with the Single Farm Payment system now in place. Although water use can also be managed through cross-compliance requirements, the basic resource itself is perhaps more vulnerable than previously considered, precisely because of a change in climatic factors. Another aspect is water resource exhaustion that has its origin in expanding irrigation within historically arid areas; because of climate change, arid zones are also in expansion. In order to assess the resiliency of agricultural commodity production capacity, it is logical to model the consequences of extreme and prolonged drought, along with the effects of permanent depletion (at least, within the current historical framework) of ground water resources, in the more vulnerable areas of the EU with regard to this eventuality.

DEMOGRAPHY

The current expectation with regard to population movements is that the eastern edge of EU-27 will be subject to a massive exodus of younger persons towards their national urban centres and onwards to the major European metropolitan areas. This impact of this expectation on agricultural production capacity has not been fully modelled. Under certain conditions of rapid capitalisation it would be possible to maintain the current area under production; there would be a definite shift in farm structure and a probable change in the quantities of agricultural commodities coming from this area. It is also possible to test a variant of this population dynamic, as a counterfactual situation. The assumption would be that this pattern of out-migration does not occur and, in addition, that because of increased prosperity, the population growth rate rises by 2015 to that of Western Europe. The premise would be that

instead of a population decline, the residential population would stabilise where it is located now, and this supposes that the economic vitality of rural areas would increase. The effects in terms of farm structure, localisation and quantity of agriculture output, and ultimately land allocation between residential and other uses – such as forestry – would be considerably modified.

AGRICULTURAL TECHNOLOGY

Yield increases for agricultural commodities are projected to continue in a somewhat linear fashion. In face of projected demand, future yields can be translated into declining requirements for land, according to the commodity. This applies both to arable land used to satisfy human consumption, permanent crop area and land devoted to fodder and pasture. There is, as mentioned above, an uncertainty on true demand, when taking into account the level of commodity production required for providing feedstocks for biofuels. On the other hand, there may be a technological divide appearing on the horizon, which will be more fully appreciated by 2010. Agricultural technology may be proposing a fully operational alternative to traditional cultivation practices for a number of crops having high added value: primarily vegetables, but also soft or ‘exotic’ fruits. Green house technology will become more pervasive, especially around urban centres, with controlled environmental conditions, reduced footprint (that is a bonus around urban areas), and extremely high yields per ha and per AWU. In addition the possibilities for better input management and higher yield that is associated with precision farming also means that more conventional agricultural practice will require less space to meet demand. The implications of agricultural technology for land values and on land allocation may be quite different than currently assumed, with the territorial effects in terms of farm structure, agricultural employment and overall land allocation.

INSTABILITY OF WORLD MARKETS

What if world demand for agricultural commodities would literally explode, causing turmoil in world markets and rapidly oscillating commodity prices as iterative adjustment occurs between demand and supply? This prospect becomes a distinct possibility as both China and India are entering commercial and industrial markets at the world scale, in which they are able to compete for agricultural commodities in a world market, and are therefore no longer dependent on internal supply capacities. Given the environmental disruption caused within these two rapidly expanding economies, internal supplies may indeed fail. How will commodity shortages be reflected in the markets for capital, land and employment within the agricultural sector? Can Europe serve as a breadbasket for the world? What will happen if energy through biofuels comes into competition for food? Will increased prices for food have a deflationary effect throughout the economy?

ANIMAL DISEASE

The blight in the beef market caused by the BSE may pale in comparison to the potential damage to world chicken supplies that may be caused by avian influenza. One disease after another becomes a focus of preoccupation and potential market disruption, as was the case following the outbreak of swine fever in the Netherlands and of foot and mouth disease in the UK a few years ago. Considering the rapidity with which disease spreads, either by animal transport or migratory vectors, veterinary pandemics are likely to occur with increasing frequency. This eventuality is impossible to predict in its exact nature, but the effects within the agricultural economy are possible to model, in function of the presumptions that are employed. The interest of such modelling is to see the way in which the balance of agricultural commodity demand may be influenced, and also the way in which the spatial repercussions are expressed.

FREE MARKETS AND CAP PILLAR 2

Progressive liberalisation of trade will mean rising prices for many agricultural commodities in the world market, but also a better distribution of market access by farmers across the world; demand would be stimulated by rising incomes, partially resulting from the growth in trade generally and partially resulting from tax savings to consumers when export subsidies will cease and increased earnings to producers who will not have to lower prices in order for their produce to enter into markets across tariff barriers. Agriculture in the markets that were formerly protected will reorganise production output in face of world competition; the net effect will be a more robust agricultural economy, but with significant shifts in what, and how much, is produced where. Agricultural employment will decline, but the average income of farmers will rise. Within the European Union, the implication for the CAP is that the market measures of 'Pillar 1' will no longer be applied, which will leave the focus of CAP on 'Pillar 2' as part of a structural policy for rural development from the perspective of the agricultural (and forestry) sector. The impact of a shift in emphasis from Pillar 1 to Pillar 2 will have significant impacts in the employment of the factors of production – capital, labour and land – that are related to agriculture and to the rural economy as a whole.