THE FARM AS AN ENTERPRISE

- The European Perspective –

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ABSTRACT

Farming conditions in Europe are changing substantially. The liberalisation of agricultural commodity markets is accompanied by an increasing societal demand for environmental services to be provided by the farming sector. Significant changes are necessary to enable the farming sector to cope with these challenges. The paper describes some general developments of the past and outlines perspectives for the future. Explicit consideration is given to the future of single ownership family farms on one hand, and the perspectives and structural requirements of large scale farming in crop and livestock production on the other hand. The analysis shows that the future competitiveness of the European farming sector largely depends on political decisions. Given the romantic views of the majority of the population as well as many politicians it is everything but certain that the agricultural policy will provide the basis for an economically efficient and therefore globally competitive farming sector in Europe.

Introduction

Things are changing dramatically in European agriculture. Small size family operations are not in line anymore with state of the art farming technology and economic conditions of a liberalized world market for agricultural commodities. From an economic point of view structural changes in the farming sector, leading to larger, specialized agribusiness organizations, seem to be overdue.

However, politicians in most European countries are looking elsewhere. They dream of a world of small and self-sufficient farm household units producing some surplus for the

cityman. Moreover, they want the surplus to be consisting mainly of scenic landscapes for the urban weekend romantics rather than of quality food products at affordable prices. The perception gap between the 3 to 5% of the population comprising the farming community and the other 95% of city dwellers is widening. There is almost no common language anymore.

Obviously, this process is further encouraged by the tourism and leisure industries, as well as by environmentalists and single cause interest groups. They all seem to like the rural world of the past, of course, without the tough life of those times.

On the other hand, everybody loves good food, and they love it cheap. To put it bluntly: Urban consumers like the production costs and the retail prices of a million chickens – computer controlled – in a single confinement and – at the same time – the good feeling and pure conscience provided by a flock of half a dozen hens and a rooster roaming freely in the barn yard and elsewhere.

How can this gap be bridged, how will consensus eventually be reached? At present, only one thing seems to be sure: Somehow we have got to solve the problem, otherwise farming in Europe may become a business of the past, extinct like many other crafts.

Basic developments in the farming sector

How did it come to this situation, what are the reasons? – For the last 50 years or so farmers tried to raise or at least to maintain their income levels by increasing the production volumes per labour unit. Given a certain surplus per product unit, this process should lead to income growth for the farming families. In order to augment the production volume per labour unit, basically two strategies were pursued, namely (i) increase of the yields per land and/or per animal unit and (ii) increase of the acreage and/or the herd size to be managed per labour unit.

Since almost 90% of human labour needed to cultivate a land unit or to tend a livestock unit are independent of the yield levels, strategy (i) leads to higher production volumes per man hour. By harvesting e.g. 10 tons of wheat per hectare instead of only five, the

amount of labour per product unit is almost cut in half, providing for substantial cost reductions or income improvements respectively.

However, this strategy has one major disadvantage. Increasing yield levels sooner or later evoke overproduction and, as a consequence, falling product prices, meaning less profit per product unit. Farmers are caught in a treadmill: More production yields less profit. Less profit is compensated by ever more production, etc.

Strategy (ii) – inreased acreage and/or herd size per labour unit – does not have this undesired consequence, but on the other hand, requires capital investments for land base and/or herd size expansion as well as for the acquisition of labour saving technology. While technical progress is the necessary condition for strategy (ii), the sufficient condition is the availability of additional capital.

Labour saving technology accompanied by high seasonal capacity per machinery unit needs more acreage to become economically viable. The fixed costs have to be spread across a larger production volume in order to really generate more income for the operator.

In big multiperson farms strategy (ii) was relatively simple to accomplish. On their large land bases farmers substituted human labour through modern technology by continuously decreasing the farm‘s labour force. Only relatively small amounts of additional capital were necessary to support this process.

The future of the conventional family farms

But European farmers are mainly family farmers. In a family farm without hired labour, however, things are not that easy. Saving labour in this case would sooner or later result in part-time farming or abandoning farming entirely. So, for a family farm to continue, only two options are left, either (i) by ignoring technological progress, i.e. by further employing less than state of the art technology, or (ii) by increasing the farm size continuously such that modern technology may be used at full capacity.

In the long run persuing option (i) leads to growing gaps between the income level generated by farming and other non-farming occupations. Sooner or later – sometimes in the next generation – the family will give up and look for work elsewhere.

Option (ii), on the other hand, requires a growing farm size. And farm firm growth calls for a continous process of raising capital for net investments. Since at least part of the capital has to be provided through saved income, this process means less disposable income for the farm family, i.e. less consumption. Only few farm families are willing to bear this permanent burden.

So, at least in the long run, both options seem to lead nowhere. Traditional family farming is obviously stuck in a no win situation. In general, the technological frontier is expanding much faster than the ability of most farming families to make full use of it. Sooner or later the capacity of large scale machinery units surpasses the land base of any single family farm. In order to operate under least cost conditions and to fully capitalize on inherent economies of scale, technological units have to be employed by more than just one farm. This, however, will result in very basic changes of the organisational set-ups in the farming sector: the traditional single-ownership family farm will increasingly be replaced by a large variety of organisational forms ranging from relatively simple partnerships to complex corporations (KÖHNE, 2000).

Large scale farming technology and structural requirements in crop production

Under West European climatic conditions the maximum seasonal capacity is for ploughs about 800 ha, for rotary tillers combined with drilling machines about 1000 ha, for tractor pulled fertilizer and pesticide sprayers about 2000 ha, for field choppers (forage harvesters) about 1500 ha, for combine harvesters about 800 ha, for sugar beet harvesters about 700 ha and for big balers about 500 ha. Even in Germany, e.g. with its large farms in its Eastern part, there are hardly structural conditions for using these machines on a single farm base. Of the total of about 430,000 farms only 1600 , i.e. less than 0.3%, cultivate more than 1000 ha, the total area of those farms comprising about 3 Mio. ha or 1/6 of the German agricultural area. Assuming for a multi-enterprise farm a minimum land base of 3000 ha necessary to employ modern technology at full capacity,

at present only about 5% of the German agricultural area would be suitable for single farm mechanization.

In other words: In Europe in the near future land will be not be tilled anymore by machinery, owned by the single land-user. Instead it will more or less completely be cultivated by specialized service organisations – private contractors, machinery co-operations, etc. – because of obvious cost advantages.

But for large scale technology to become economically viable, the precondition is not only enough land per machinery unit. In addition, the land should be less fragmented as it is now. In order to decrease the idle time for transporting the units from parcel to parcel, as well as for turning the machinery around on the plots, large rectangular pieces of land would be most desirable. In many parts of Western Europe, however, the average size of parcels is about 1 ha. In other parts of the world this would be considered as gardening. Large scale machinery can only be operated at least costs on parcels of 50 to 100 ha each. Calculations for cereals growing e.g. show, that differences between labour and machinery costs for a presently typical mechanization on 1 ha parcels and large scale machinery on 60 ha parcels are about 250 € per ha or 40 € per ton. This is actually 1/3 of the current wheat price (WISSENSCHAFTLICHER BEIRAT, 2000).

Moreover, there is another severe constraint: Because in many parts of Europe farms are concentrated in villages, farmers can only access their fields via public roads. On public roads, however, the maximum width for vehicles is only 2.5 to 3 metres. Large scale farm machinery, however, is often broader. Thus, many farmers are looking for a complete separation of farm roads from public roads.

Up to now the pressure for large land parcels was not too high, the mayor reason being that on large parcels the variance of non-controllable plant growth factors like plant usable water and contents of basic nutrients tends to be higher than on small plots. Historically, one reason for small plots has of course been that farmers wanted homogenous plots which enabled them to better adjust their tillage and fertilizing activities to the particular soil conditions.

Modern technology of precision farming, using global positioning and geographical information systems, however, has relaxed these constraints. One could even say that while large parcels are the necessary condition for operating at least costs, the availability of precision farming techniques are the sufficient condition for large scale technology to become economically superior. It assures that waste of fertilizers, pesticides and other plant growing materials is put to a minimum, which besides obvious economic advantages has the additional positive effect of reducing the probability for environmental damages (HARSH, 1999; AUERNHAMMER, 2001; KUHLMANN, BRODERSEN, 2001).

On top of that, IT-based farming technology has another major advantage. In combination with appropriate communication technology (cellular phones, wireless sets, etc.) it enables the new land tilling organisations to efficiently control their expensive units with respect to time and space, thereby ensuring high employment rates and least costs. Generally speaking: It reduces coordination and transaction costs as a major precondition for these organisations to become economically superior to conventional family farms.

In summary, it may be safely stated that modern large scale farming technology in combination with large land parcels and separated farm road systems, and controlled by state of the art information and communication technology has the potential for substantial reductions of the production costs for agricultural commodities. This would result in more competitiveness for European agriculture in a liberalized world market and would therefore be certainly adopted by the agricultural entrepreneurs.

On the other hand, from the point of view of the single family farmer, the implementation of these technologies and their organizational set-ups would mean that more and more value added will not be generated anymore by the original land user. Instead it will be earned by other entities. Production of agricultural commodities will become a multi unit operation, i.e. a network of several specialists of which the original landuser is only one. His income might eventually be reduced to the land rent – if he remains the landowner – and some premium for bearing the price and production risk. Most of the activities, including managerial and advisory tasks, necessary to produce agricultural products, will be performed by specialized organizational entities, and for

that matter, by other income generating business units. In the long run, the majority of the conventional land users may become part-time farmers or even only land providers (BERG, 1999).

Current developments and the historic perspective for structural changes in the agricultural sector

Actually though, the above outlined structural changes of the agricultural production system are only one phase in a long lasting transformation process. If we look at the farms of the 19th century, being almost closed production and consumption units, then the continuous transformation process is revealed more clearly.

Technological progress allowed for increasing degrees of labour division in the food producing chain. As transaction costs due to technological innovations for transportation of goods and information sank, the land users took advantage of these innovations by buying and selling more and more goods from other specialized enterprises and to other specialized enterprises, respectively. But sooner or later it became obvious that the single farms were overcharged with these tasks. In order to capitalize on economies of scale and the advantages of enhanced market power, the farmers established market cooperatives which by now are in fact highly independent and large scale business entities. So, activities which were first conducted by the farmers themselves, for good economic reasons, went to other organisations thereby taking some of the value added with them.

At present, we are witnessing basically this very process again. But now it is not the physical distribution and the marketing activities. This time it is the production processes at their cores, which are continuously given up by the original land users and taken over by specialized large scale service organizations. Only they are able to take advantage of the economies of scale and the reduced coordination costs. Another chunk of value added changes hands.

But this scenario with its cost reductions for food products and – as a desired consequence - its benefits for the consumers can only become full-scale reality, if the rural areas in many parts of Europe would be transformed such, that they consist of

large, rectangular pieces of land and of farm road systems, not open to the general public.

Large scale technology and structural adjustments in livestock production

Making use of economies of scale by implementing large scale technology in combination with appropriate information and communication technology seems also economically beneficial for the livestock sector (HUIRNE, HARSH, 1999). Herds of 300 dairy cows, 600 other cattle, 300 sows and 3000 feeder pigs e.g. are of course technically feasible and economically viable. Besides, these herd sizes are already common in other parts of the developed world. As an example for most of Europe, in Germany the present average herd sizes are 30 dairy cows, 40 other cattle, 40 sows and 100 feeder pigs.

From an economic point of view this certainly is not state of art livestock farming. But on the other hand, it also means that there are still many small farmsteads contributing to a scenic and bucolic landscape. Germany has about 32.000 villages. On average, at present every village houses 5 dairy herds, 8 other cattle herds, 2 sows herds and 5 feeder pig heards. Assuming the above sketched larger livestock herds would mean that in the near future there would be only one dairy and one other cattle herd in every second village, only one sow herd in every fourth village and only one feeder pig herd in every sixth village (WISSENSCHAFTLICHER BEIRAT, 2000). Certainly, the villages would loose part of their typical character, considered to be so valuable by the urban populace and – as a consequence – by numerous politicians.

Societal and political demands

The European Common Agricultural Policy (CAP) promotes the idea of a so called multi-functional agriculture, which not only provides food products but jointly serves the society by protecting the natural environment and preserving or even improving the amenity of the landscape. This objective is explicitly stated in the Agenda 2000 directive that was passed at the Berlin summit in March, 1999. It is argued that the current subsidies are partly a compensation for the environmental services associated with farming. The EU member countries are therefore entitled to implement a cross

compliance approach by linking the direct payments to environmental objectives (WILLE, 1999).

While this approach certainly meets societal demands in Germany as well as other EU member countries, it is not without problems for the farming sector itself: Linking direct payments, which are basically oriented towards improving farm incomes, to environmental requirements clearly involves the danger that the level of payments will be determined primarily by distributional objectives and therefore would not reflect the true willingness to pay or the scarcity of environmental goods, respectively (SCHMITZ, 1999). In this case, the resulting effects would be distortions of competition and the conservation of inefficiencies within the farming sector.

For many politicians the picture of an economically efficient but otherwise „ugly“ agriculture obviously seems like a horror vision. In order to prevent this picture to become reality, the politicians maintain old regulations and try to implement new ones. Structural changes in the agricultural sector, driven by economic necessities, are considerably slowed down or even coming to a halt due to these regulations.

So, what will be the future of the farm as a competitive enterprise in Europe? At this point in time nobody can make any substantiated predictions. Economic considerations call for efficiently managed professional enterprises employing state of the art technology, and performing different specialized tasks in the agricultural sector. But farming in Europe is only a small industry. The vast majority of the population want their romantic weekend trips. Conducting agriculture under such conditions, however, would – among other things – certainly mean that our continent would have to become a self-sufficient and inward looking „fortress Europe“. Only time will show if that is going to happen.

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