Perception of dairy farming from different views – results of a stakeholder discussion in the region Altmark, Germany

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Abstract
Path dependence is a phenomenon which can also be observed in agriculture. Especially structures in German dairy farming are very heterogeneous. The abolishment of the milk quota system in 2015 offers opportunities and challenges for dairy farmers at the same time. Our research aim is to find out to what extent a changing policy environment will affect structural change in the dairy sector. Therefore it is interesting to build different scenarios to analyse path dependence, path breaking and path creation. In this contribution we focus on results from a first workshop in our German study region Altmark. We used participatory methods for the analysis of mechanisms, trends and policy effects in the regional dairy sector. In this first stakeholder workshop we collected different views of stakeholders on dairy farming in the case study region, discussed assumptions of the model AgriPoliS and identified hints for potential scenarios.

Introduction
Agricultural farms in Germany are regionally very heterogeneous. While farms in Western and Southern Germany are dominantly small-scaled farms in Eastern Germany have mainly a much higher amount of land, and livestock is kept in much larger units. Historical events are an explanation for these differences, i.e. the establishment of collectives in GDR times was the basis for the large-scaled agriculture nowadays. History matters! And this is not only valid for the development of farm sizes but also for the kind of production the farm is set up for. If e.g. a cowshed was built, it is not easily possible to use it for another production process. In other words: sunk costs exist.

Decisions already taken influence future decisions to a certain extent. This phenomenon is called path dependence (c.f. North, 1990; Sydow et al., 2005; Schreyögg et al., 2003). This concept was analyzed in a lot of fields. Brandes (1978) and Balman (1994) used it to explain phenomena of structural change in agriculture. Path dependence can be caused technologically as well as institutionally. Kay (2003) applied institutional path dependence on the Common Agricultural Policy (CAP).

Following Kay “a system is path dependent if initial moves in one direction elicit further moves in that same direction; in other words there are self-reinforcing mechanisms or positive feedbacks” (Kay, 2003: 406).

Let us have a closer look on the milk production considering path dependence. In 1984 the European Union (EU) introduced the milk quota system with price support mechanisms. The milk quotas were introduced in the Common Agricultural Policy (CAP) of the EU as a measure to solve the problem of so-called “milk lakes” caused by an oversupply of highly subsidized milk. Dairy farmers got quota rights based on their previous milk production. To expand the production farmers had to buy rights from other farmers who reduced their production. The result of the quota system is that growth willing farmers could and still cannot increase their dairy stocks because they have to wait till quota rights are available. These rights had and still have to be purchased for a relatively high price. The result of the highly regulated and subsidized dairy sector in the EU is a decelerated structural change and the establishment of sub-
optimal farm structures. Hence, the German dairy sector today faces severe structural deficits.

On the basis of the concept of path dependence the question comes up to what extent path dependent structures in agriculture can be broken. The policy environment of the dairy sector has most likely had an influence on the possibilities for structural change within the sector. In other words, the path dependence of the CAP (Kay 2003, Ackrill and Kay 2006) has most likely been one important reason for path dependence in European agriculture. For example, the milk quota system affects the opportunities for farms to grow as growth requires that other farms shrink or exit by selling their quota to the growing farms. Because political framework conditions influence individual decisions on the micro level, a policy change can lead to new path options (Nielsen, 2006). In the end of 2008, the EU decided to phase-out the milk quota system by raising the quota 1% each year until 2013 and to abolish the quota system fully by March, 2015. The path of quantitative limitation in milk production, therefore, lasts until 2015. The future abolishment of the milk quota and further liberalization is therefore likely to affect the conditions for structural change in the dairy sector and brings great challenges. It will require dairy farmers to adjust to the new framework and cope with probably low future milk prices.

A main aim of our research is to analyse to what extent a changing policy environment (i.e., abolishment of quotas) will affect structural change in the dairy sector. Therefore it is interesting to build different scenarios to analyse path dependence, path breaking and creations of new paths. In our research we target the following questions: To what extent are dairy farmers able to overcome structural deficits? Do policy instruments solve or solidify structural problems of the dairy sector? Do farmers’ mental models play an important role? To answer these questions the agent-based model AgriPoliS (Agricultural Policy Simulator: Happe 2004; Happe et al. 2006, building on Balmann 1994, 1997) is used. In stakeholder workshops assumptions, possible scenarios and simulation results are discussed.

In this contribution we focus on results from a first workshop in our German study region Altmark. We used participatory methods for the analysis of mechanisms, trends and policy effects in the regional dairy sector. In this first stakeholder workshop we collected different views of stakeholders on the milk production in the case study region, discussed assumptions of AgriPoliS and identified hints for potential scenarios regarding framework conditions in the region.

**Methods**

The case study region we chose is the Altmark in Northern Saxony-Anhalt, Germany. The Altmark has a high share of grass lands (ca. 25%), mainly poor soils, and a low level of precipitation. Farms are largely structured with an average size of ca. 220 ha and an average dairy cattle size of ca. 170 (StaLa, 2008). Dairy production plays an important role. At the same time there are only few off-farm income opportunities. The unemployment rate was 2009 16.2% of the civilian labour force in the district Stendal (east part of Altmark) and in Altmarkkreis Salzwedel (west part) 12.6 %
In total agriculture offers jobs to 6% of employed people. Agriculture as a regional employer is therefore of high importance.
Farms are working with modern technologies and on a very high level of performance. Because of the generally low rate of equity and a high share of rented land as well as work force which have to be permanently remunerated even these farms can be existentially affected by low milk prices.

To what extent opportunities for path breaking and creation exist and how far paths are solidified by subsidies and quotas is analysed with the agent-based model AgriPoliS. AgriPoliS serves as an experimental laboratory to examine policy impacts on structural change in different regions. The agents’ aim is to maximize their household income or profits (legal entity) by using given resources. Every agent can invest, produce, rent land or exit farming. The agents’ decisions are based on a mixed-integer programming approach while they can choose from different production and investment alternatives. At the same time they consider operational resources and the state of their environment.

To represent the Altmark region in the model we used model farms derived from data of the farm accountancy network (FADN). In total we have 968 hypothetical farms which represent 1239 real existing farms. Dairy production is oriented to normative data from Brandenburg (MLUV, 2008: 106f) and constitutes the situation of efficiently farmed companies.

To gain insights in mental models and to improve the model AgriPoliS a main part of our research is the involvement of stakeholder knowledge by using participatory approaches. Participatory methods emerged in the area of development cooperation in the 1970s and 80s. They were further developed in the research field of “integrated assessment” which is “a relatively new field of decision support in which scenarios are used as tool to explore complexity” (Greeuw et al. 2000). Simulation models are often a central element. Participatory methods can be used for the organization of workshops with stakeholders and in particular for scenario building. Hare and Pahl-Wostl (2002) as well as Pahl-Wostl (2002) have used different participatory methods to involve stakeholders. Focus groups have been developed “to explore in a well-defined setting the range of arguments and perceptions” of stakeholders (Pahl-Wostl 2002). The group is led by a professional moderator who supports the discussion objectively and hence should not be a researcher or focus group member (Dürrenberger et al. 1999). Advantages of the focus group technique lie in group interaction, i.e., that during the discussion opinions can be changed and new views and opinions can be formed (van Asselt-Marjolein and Rijkens-Klomp, 2002 and Newig et al. 2008).

Using participatory methods we plan in total three workshops in the Altmark region which shall be held from November 2010 until November 2011. In a first meeting in November 2010 different views of stakeholders on the Altmark’s agriculture were collected. The aim was to predefine regional distinctions, structural deficits, impacts of policies and useful policy measures to further elaborate policy scenarios which will
be finally built in a second workshop, the scenario workshop. The main focus of the discussions lied on the events in the dairy sector, agricultural aspects (e.g. possible instruments of support) as well as technological innovations and developments.

In total 20 stakeholders met to discuss with each other. Participants were mainly strongly connected with agriculture; solely eight participants were farmers or chairmen of agricultural co-operatives. The other participants came from fields of agricultural associations, politics, dairy manufacturing and administration. To collect the different views of stakeholders we divided them into three groups: group 1: farmers, consultant (9 persons); group 2: administration, ministry, farmers’ associations, dairies, cattle breeders’ association (8); group 3: politicians, water association (3). The reasoning for grouping the participants is on the one hand the number of invited persons. A group of 20 people is too large for an intensive discussion. On the other hand debates with political strategies should be avoided. A third aspect is the analysability of discussion results. By dividing into groups statements of different stakeholders and differences within one group can be better identified.

The workshop took place in the center of the Altmark region and lasted seven hours. First we provided the participants with input for the discussion. The project was presented and results from a former study about dairy farming in the region were shown. Afterwards we had two group discussions. The first one with the topic “milk production in the Altmark: status quo, developments and future perspectives” was set to get an impression how stakeholders perceive dairy farming in the Altmark at the moment. Furthermore, the question was raised how the sector could develop if framework conditions stay the same but the milk quota is abolished in 2015. In a second discussion round (“challenges and solution strategies in dairy farming”) stakeholders had the opportunity to express their wishes regarding dairy farming in the Altmark by assuming that framework conditions can be changed. Thereby one question to be discussed was who can and should contribute to the wished changes. Can farmers themselves solve problems or are after all politicians or even the supply chain called upon?

In all groups discussions were tape-recorded and main findings were summarized on a pin board. After each discussion round all participants came together to find out about the results from the other groups. So, they could discuss also opinions of other stakeholders.

**Results**

In the following we first present results of discussion round one. With the first question we asked the participants to mark a point in a coordinate system with the importance of subsidies for the regional milk production on the x-axis and the role of agriculture esp. milk production in the region on the y-axis. Figure 1 shows the results of the different groups. Interesting is that all participants assess dairy farming as important or very important but regarding the relevance of subsidization the results are much more heterogeneous. The group of farmers itself is very heterogeneous. One reason could be the diversity among farmers: we had family farmers as well as
chairmen of cooperatives, farmers from small farms and big farms, and even one organic farmer.

Fig. 1: Assessment of current milk production in the Altmark

Source: own results

The second question in round one was to list positive and negative sides of current dairy production in the Altmark. The results are shown in table 1. It is not surprising that farmers listed the most positive and negative aspects as they are faced with these issues every day. Group one is the only group which involves the population. Participants mention that on the one hand the low population density is positive because farming is well accepted. On the other hand the low population density can be negative regarding consumption of regional products and lack of skilled workers. Some points were even similar between the groups. For example the high share of grassland which is cultivated by dairy farms is one common positive aspect. Also mentioned by more than one group is the long tradition of dairy husbandry in the Altmark region. On the negative side common points are the quite poor natural conditions and the structure of the dairy processing industry. There are only few large milk processors.
### Tab. 1: Positive and negative aspects of milk production in the region Altmark

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>positive</strong></td>
<td><strong>negative</strong></td>
<td><strong>positive</strong></td>
</tr>
<tr>
<td>high share of grassland</td>
<td>poor soils</td>
<td>free stable capacities</td>
</tr>
<tr>
<td>low rental prices</td>
<td>increasing rental prices</td>
<td>cultivation of grassland</td>
</tr>
<tr>
<td>regional identity</td>
<td>competition through biogas producers</td>
<td>quota as a barrier for growth</td>
</tr>
<tr>
<td>tradition in dairy farming</td>
<td>bad infrastructure</td>
<td>concentration in milk processing</td>
</tr>
<tr>
<td>low population density</td>
<td>low population density</td>
<td></td>
</tr>
<tr>
<td>acceptance of population</td>
<td>demographical change</td>
<td></td>
</tr>
<tr>
<td>dairy processors in the region</td>
<td>too little regional processing</td>
<td></td>
</tr>
<tr>
<td>little industry</td>
<td>too high environmental restrictions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bureaucracy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>work force</td>
<td></td>
</tr>
<tr>
<td></td>
<td>natural conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cross-subsidization is difficult</td>
<td></td>
</tr>
<tr>
<td></td>
<td>linkage between milk and biogas production</td>
<td>volatile milk price</td>
</tr>
<tr>
<td></td>
<td>direct marketing is difficult</td>
<td>lack of skilled workers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: own results

A third question in discussion round 1 was: Considering the milk quota abolishment in 2015 which positive and negative developments in dairy farming in the Altmark could occur? Main answers are shown in table 2.

Generally positively seen is the abolishment of quota as a hindrance of growth. After 2015 there will be more scope for formative action for dairy farmers. On the other side it is also mentioned that without quota the role of milk processors increases and farmers will be depending on dairies. Furthermore the price fluctuations will increase.

Groups 2 and 3 refer to the possible development that dairy farming could migrate and grassland could fall idle. A solution could be that more external investors invest in dairy farming but this is seen critically.

In the second discussion round where stakeholders were asked to suggest possible developments under undefined framework conditions we got following main results:

Group 1 underlined the need for stable and calculable framework conditions, including a sustainable policy in the field of market, policy and environmental issues. Also mentioned is the reduction of bureaucracy. In this area policy makers are called upon. A competitive income development is desired as well; also because farmers would like to pass the farm to their descendants healthily.

Group 2 would like to see more producer associations. Furthermore working places in rural areas are needed. Agriculture could contribute in this field. Direct marketing could also be a possibility to increase income.

Group 3 suggests more ecological farming and direct marketing as a source for income. A possibility could be to pay farmers for their conservation measures. More and especially smaller dairies could generate net-value added for the region.
Agriculture could also serve as a source for decentralized energy supply. But when biogas production increases it should be thought of restrictions for maize cropping.

Table 2: Possible future changes in dairy farming under current framework conditions

<table>
<thead>
<tr>
<th>Group 1</th>
<th>positive</th>
<th>negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no quota as a barrier for growth</td>
<td>dependence on processors</td>
</tr>
<tr>
<td></td>
<td>more scope for formative action</td>
<td>increasing price fluctuations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>more rapid structural change</td>
</tr>
<tr>
<td></td>
<td></td>
<td>intensified bureaucracy</td>
</tr>
<tr>
<td>Group 2</td>
<td>free market</td>
<td>migration of dairy farming</td>
</tr>
<tr>
<td></td>
<td>free decision making</td>
<td>more external investors</td>
</tr>
<tr>
<td>Group 3</td>
<td>reduction of overproduction</td>
<td>progression of concentration of production</td>
</tr>
<tr>
<td></td>
<td>no industrialization in dairy farming</td>
<td>less cultivation of grassland</td>
</tr>
<tr>
<td></td>
<td>competition through biogas producers</td>
<td></td>
</tr>
</tbody>
</table>

Source: own results

Not all results answered the questions. Our questions rather were an impulse to start discussing important aspects of dairy farming. Therefore, we summarize much discussed topics to complete the picture of stakeholder views on dairy farming in the Altmark. Because in discussion rounds one and two nearly the same topics were discussed we describe in the following these results from discussions in both rounds. Groups 1 and 2 discussed mainly five topics (biogas production, milk processors, regionality and direct marketing, labour situation and demographical change as well as bureaucracy), group 3 focused on three issues (biogas production, milk processor as well as regionality and direct marketing).

Topic 1: biogas production

Biogas production was a much discussed subject in all groups. Participants of group 1 stated that subsidizing biogas production leads to huge distortions of competition and biogas producers can be strong competitors on land markets. By receiving high subsidies biogas plant operators were able to pay much higher land rents than other farmers. The reason for this is that once a plant is built it must be provided with substrates to be economical. Although first there were a lot of negative statements on biogas there were also comments that diversification of a farm can have advantages as well. Cattle manure can be further processed and possibly a farmer can survive during low milk price periods when producing biogas. Participants of group 1 commented that biogas plants should be suitable in size for the farm. Otherwise the internal competition between animal feed and biogas substrates increases. One result of the discussion was that plants should stay in the hands of farmers and not of large-scale investors from outside the Altmark.

Biogas was also strongly discussed in group 2. Biogas production is only reasonable in case of the use of farm owned manure. A suggestion was to increase the so called
manure bonus at the expense of the bonus for renewables. The combination of biogas and cattle manure is seen as a source of additional value added, which can also serve for cushioning volatile prices. The third group demanded decentralized energy supply from agriculture. Especially grass, also extensive grass, should be used for producing biogas to relieve the land market. The use of maize silage could be replaced by grass silage. The result would be that rental prices for arable land would not rise that much. Dairy farming is based mainly on maize which is farmed on arable land. If rental prices for arable land continue to rise, dairy farms in the Altmark will be affected. Furthermore the expansion of maize cropping is seen critically. A possible restriction to 25-33% maize cropping of the total usable agricultural area (UAA) should be considered.

Topic 2: milk processors
For farmers happenings in the downstream field of milk production are of high interest. While group 1 considers two processors in the region sufficient to process milk from the Altmark region, group 3 would like to see more dairies in the region, especially smaller ones. Farmers fear the increasing pressure on themselves not only because food retailing is highly concentrated but also because of high competition between dairies.

Topic 3: regionality and direct marketing
Regional marketing is desired by all groups. A problem from farmers’ view is, however, that there are only a few niches in particular for large farms. The pressure to produce mass is high. Another difficulty for realizing sales markets lies in the income development and a relatively low buying power of the population. To better the bad positions of dairy farmers group 2 suggests producer associations to bundle milk supply and to achieve a better negotiating position vis à vis the dairies.

Topic 4: labour situation and demographical change
The situation on the labour market in the Altmark was discussed only by groups 1 and 2. Critically seen by group 1 was the competition of agriculture to other branches of the economy which can offer attractive working places and pay higher wages. The recruitment of young employees from the region is very important to have skilled agricultural personnel in future. Some work on the farms will increasingly be replaced by modern technologies such as milking robots. Manual work is nevertheless needed. Especially executives are in future demand. Group 2 discovers also a lack of skilled workers, but notes that there are definitely a lot of young people who would like to work in agriculture. But one has to consider that there is a difference between low-skilled jobs and positions requiring highly-skilled workers. For the first there is a big supply but for the latter the supply is decreasing. An adjustment of salaries to other branches will probably not be avoidable in future. Politics should more emphasize safeguarding of jobs in agriculture by considering e.g. working places in case of capping of direct payments or promotion of competition.
Topic 5: bureaucracy

Bureaucratical costs and an increase of requirements were criticized by groups 1 and 2. But farmers do not have to take constraints as given facts. They can also intervene when new rules are defined (e.g. in case of a nature reserve). Communication with other parties is stated as very important. On the one hand farmers could acquire the population’s understanding by communicating; on the other hand requirements could be reduced. Group 2 sees the future in a better cooperation of single parties. But for an open communication it is necessary to reduce ideologies.

Discussion

Different views on dairy farming in the Altmark could be assessed. Even if the workshop was well planned there was no guarantee that every registered participant would come. Unfortunately most of the people who did not come were in group 3. Therefore discussion results of this group are very much related to the background of the three stakeholders in this group. In groups 1 and 2 the participants were quite heterogeneous. The narrow time slot was a challenge for these two groups. There was a very high requirement for discussion also because of the manifold views of participants. Therefore, it was difficult to receive utilisable results. But for a first overview about the regional specialties in dairy farming and topics of interest results were very useful.

So far participants were quite free in their discussion. Thus some issues of scientific interest have not been raised yet. For developing scenarios it is desirable to get information about policy measures and instruments. Furthermore, mental models of participants should be more elaborated on.

Given the results of the workshops we plan to improve assumptions in AgriPoliS and define scenarios in advance to further discuss them with stakeholders in a second workshop.

Not all information could be taken into consideration when improving assumptions and defining possible scenarios for dairy farming in the Altmark region. AgriPoliS is an agent-based model on farm-level. That means we cannot consider developments in the downstream sector unless they result in monetary benefits or losses for an agricultural product. We also do not model the demand for different products. Agents can produce as much of a product as they want considering only their resources but not the demand side. In case of direct marketing it could be possible that agents in AgriPoliS market milk products directly but in reality there would be a lot of difficulties in this niche. Because of the relative unimportance of direct marketing today, the demographical change and high migration out of the region the future potential to generate income by marketing milk directly can be supposed as low. Therefore, we first will not build any scenario for direct marketing.

Also communication between farmers and the administration or population is not considered as it is not important for the rational decision making of an agent in AgriPoliS. We do not build a scenario in this topic either, not least, because we would like to analyze path dependence in dairy farming and possible options for path breaking.
So far we developed scenarios regarding biogas because biogas production was much discussed in every round and group. In total we built three investment alternatives for different plant sizes (e.g. 150 kW, 250 kW and 800 kW plants). Furthermore agents should have the opportunity to choose between different substrate mixtures.

In the field of dairy production agents get an additional investment possibility, a milking robot. Work force can be safed and milk yield slightly increased. But on the other hand investment costs are much higher than common milking methods. Because of the currency of demographical change and the difficulty to find skilled young employees we plan to adjust assumptions in this area. Possible would be a higher wage increase than before (1.1%). If of interest different qualified employees could be added and the requirements concerning the production processes could be differentiated between the needed qualifications.

Scenarios regarding policy instruments etc. will be developed in a second workshop.

**Summary and outlook**

We can summarize that certain topics are dominantly important for dairy farming in the Altmark. This concerns biogas production and future difficulties on the labour market in particular. Besides, there is a certain dissatisfaction with communication and acceptance by single groups and stakeholders. Results of the first workshop can be serve as a starting point for scenario building. Before the second workshop is held results are taken to supplement the linear programming model so that in the following workshop scenarios can be participatorily developed. To analyse path dependence and possibilities for path breaking we plan to focus on policy options and measures. Furthermore innovative technologies could lead to breaking a path. Beside the Altmark we investigate developments in dairy farming in the region Ostallgaeu (Southern Germany). The Ostallgaeu has a much higher share of grassland and farms are mostly relatively small-scaled family farms. The results from both regions will be compared afterwards.

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