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DESIRA POLICY BRIEF

Digitalisation in Flemish Livestock Farming

In this policy brief we set out the key issues around the digitalisation of livestock farming in the context of agri-environmental regulation and ammonia emissions.

Two scenarios were developed with a range of stakeholders in order to develop our understanding of this issue. Concerns of stakeholders are situated in the concurrent crises in the livestock farming industry. Both scenarios identified these crises, although in the positive scenario these crises functioned as a catalyst for more radical change in order to transform the livestock industry.

The main findings show that a successful future digital transformation depends to a large extent on the socio-political context of livestock farming and that a fair transformation of livestock farming is essential to ensure digitalisation will have a positive impact overall.

CONTEXT

This policy brief is based on workshops conducted in a Living Lab (LL) in Flanders as part of the EU DESIRA project. The central topic of the LL is the potential societal impact of measuring ammonia emissions on farms. Sensor technologies that are in development can give insights in the emissions that different farms produce, providing avenues to policy-makers in reducing the environmental impacts of farming.

The Flemish livestock industry deals with the environmental impacts that it produces. This is further exacerbated by the fact that Flemish livestock farms are often in close proximity to natural areas and housing.

Flanders, as a region in Belgium, has legislative powers over agriculture and environmental regulation, and sets its policies in accordance with EU directives. Ammonia emissions have been a driving factor in agri-environmental policy-making for agriculture over the past decades.

Policies have been focused on a combination of generic and individual measures targeting farmers and include the use of mitigating technologies that reduce emissions. Further policy has focused on tightening the environmental permit system for livestock farms, ensuring that farms do not excessively impact natural areas.

These policies have so far not been sufficient in lowering the emissions of ammonia. Emissions remain too high and still negatively impact natural areas in Flanders.

In response, a new policy is being drafted, seeking to further reduce the emissions of ammonia. Part of this development has been a focus on better measuring emissions through sensor technologies.

This is where this policy brief comes in, where we focus on the potential impacts of this sensor technology. As a case we used the potential role of these sensors to measure the ammonia emissions of individual farms.

To study this we have involved a range of actors in the Flemish livestock industry. Together with these actors we discussed the societal impacts of measuring ammonia emissions at farm level (rather than at the regional and national level that is currently considered).

RESEARCH APPROACH

Our research focuses on the role of digitalisation, and specifically of the sensor technology to measure ammonia emissions in the livestock farming sector in Flanders. The scenario question that was discussed with stakeholders in the course of two workshops is a follows: "**What will be the impact of digitalisation and monitoring on ammonia emissions in 2031?**"

DIGITALISATION IS ONLY ONE SMALL ASPECT TO LIVESTOCK FARMING. MORE PRESSING ISSUES TAKE PRECEDENT FOR FARMERS AND NEED TO BE ADDRESSED IN ORDER FOR DIGITAL TECHNOLOGIES TO BE BENEFICIAL.

The stakeholders involved included farmers, farmer unions, researchers, policy advisors and farm advisors.

These workshops followed the STEEP-methodology where we the discussion is focused along the Social, Technological, Environmental, Economical and Political aspects connected to the impacts of this technology.

SCENARIOS DEVELOPED

Because we used the STEEP methodology, discussions automatically went much broader than just on the technology and touched on issues such as environmental policies and knowledge, as well as the broader power structure in the livestock industry.

Four different scenarios were developed including a so-called "better but not best scenario" and a "worse but not worst scenario". The first was structured around an envisaged crisis that already started to be visible in the pig farming industry. In developing opportunities for this scenario, stakeholders focused on the fact that a crisis like this would allow for radical changes in the livestock farming sector.

Radical changes would open up opportunities for fairer prices, long-term stability, a just incorporation of data-driven science and policy, and the development of a new form of agriculture and livestock farming. The incorporation of data requires a certain attention, especially concerning data ownership and data access, which were primary concerns to stakeholders.

In the second scenario, which is less optimistic, a similar crisis was identified. However, a lack of long-term vision coupled with ineffective policies leads to stagnation for the livestock farming sector. Ammonia emissions are not adequately addressed in this scenario, and digitalisation has little impacts.

In the second scenario respondents engaged more with the role of ammonia sensor technologies. The main worries of respondents was that these technologies would be forced on farmers before farmers had developed the necessary skills and knowledge to use these technologies.

Because of this, a lack of knowledge around emissions and digitalisation is a concern to stakeholders. Society is seen as ill-prepared for the introduction of big data in agriculture and farmers cannot cope with the impacts of these technologies.

POLICY RELATED DISCUSSION

Several policy options were discussed during the workshops. Due to the broad view taken in discussions, policy options went further than just about digitalization. Policies suggested by participants cover a range of possible actions that could support livestock farming.

Here are the key challenges that were identified in the workshops. These are: 1) Low farm incomes; 2) uncertainty over data ownership; 3) the dominance of large corporations in the agri-food sector; 4) the lack of scientific certainty in agri-environmental impacts; 5) the lack of long-term policy plans for agri-environmental regulation; and 6) the lack of digital skills among farmers.

In general, stakeholders desired strong government intervention in livestock farming, which was a surprise to the researchers when considering the relatively negative opinion on government policies within the livestock farming sector. These challenges also go further than a focus that is purely on digital technologies.
However, they do form the basis for the 'fair' transformation of livestock farming and are necessary to provide positive impacts of digital technology adoption.

Stakeholders in both scenario groups identified the same key themes, although they somewhat differed in the approaches they saw as beneficial to supporting farmers. These differences are mentioned in the next paragraphs when describing the suggested policies.

THE CONDITIONS FOR A SUCCESSFUL ADOPTION OF DIGITAL TECHNOLOGIES RELATED TO AGRI-ENVIRONMENTAL MEASURES DEPEND ON FAIR AND JUST AGRI-FOOD SYSTEMS.

In the positive scenario, beneficial change is set in motion through government intervention in the agri-food chain. These interventions are focused on setting fair prices that take into account costs made to ensure environmentally friendly food production and fair prices for farm labour.

Fair prices would also provide farmers the necessary capital to invest in digital technologies and environmentally friendly practices.
Data ownership (by farmers) was seen as essential to the development and use of digital technologies. Ensuring that farmers trust digital technologies is essential and does need to be addressed according to the stakeholders.

In both scenarios a focus was made on improving the available knowledge on agri-environmental impacts. In particular, practical knowledge to farmers on how they can reduce their impacts was seen as lacking. Increased funding for scientific knowledge production would be needed in order to develop this knowledge.

Long-term agri-environmental policy that takes into account the multi-generational nature of farming is also seen as a positive change that could allow farmers to invest in digitalisation. The stability provided by this would ensure that investments could pay off to the farmer, which is seen as something that is lacking.

A last key issue are the digital skills of farmers, which are seen as lacking in the Flemish agricultural sector. Farmers will most likely struggle when adopting digital technologies. Positive change through policy can happen by providing ways for farmers to develop digital skills.

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POLICY OPTIONS

Fair prices

- To intervene in agri-food markets, reducing the dependency of farmers on retail in price setting.
- To set minimum prices in order to ensure that the costs of creating environmentally and socially fair food would be acceptable.
- Strong government intervention would be needed in order to push through these changes.

Data ownership

- To create regulatory frameworks ensuring data ownership by the data producer (the farmer).
- To ensure that farmers are able to see what data they share and with whom they share it.
- To ensure that this is done in a manner that allows the farmer to understand the data sharing agreements.

Agri-environmental regulation

- To create agri-environmental regulation that takes into account the multi-generational nature of farming.
- To take into account the long-term investments that farmers make by creating a stable environmental regulation that can last multiple decades without radical changes.

Digital skills & knowledge

- To create 'lighthouse farms' (exemplary farms) that are able to show other farmers how to work with digital technologies.
- To create networks around certain exemplary farms that are digitally advanced.
- To use these networks to improve the digital skills of a large group of farmers.

DESIRA POLICY BRIEF

This policy brief is published in the frame of the EU-funded DESIRA project and aims to provide recommendations for policy makers on how to support digitalization in the context of ammonia emissions in livestock farming in Flanders.

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