

## Extended Abstract

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<b>Paper Title</b>	<b>Dutch farmers' intentions to adopt climate mitigation measures: understanding the impact of social-psychological factors on different behavioural stages.</b>
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<b>Abstract</b>	<b>200 words max</b>
<p>New policy instruments targeting non-financial and behavioural factors will be introduced in the European Common Agriculture Policy, on top of the current regulatory and financial incentives, so as to mitigate climate change (EC, 2018a). Currently, the adoption of climate mitigation measures is largely based on farmers' voluntary behaviours, which has thus far proven ineffective. Effective interventions requires detailed insights into the factors and processes underlying their behavioural changes.</p> <p>This empirical study tests the relationship of a rich set of social-psychological factors with individual farmer's stage affiliation (pre-decision, pre-action, action, post-action) in adopting on-farm climate mitigation measures. Online questionnaires were sent to 300 specialized Dutch dairy farmers registered with the FADN network. A total of 108 complete records were analysed using an ordered probit regression model. Our findings suggest that it is mainly negative emotion associated with taking no climate mitigation measures and the perceived goal feasibility that have a significant impact on farmers' stage affiliation of adopting climate mitigation measures. This empirical study suggests that policy makers could focus on making farmers' negative emotion from taking no climate mitigation measures more salient as well as strengthen their perceived goal feasibility in adopting on-farm climate mitigation measures.</p> <p style="text-align: right;">Word count: 196</p>	
<b>Keywords</b>	Climate mitigation measures, Dutch dairy farmer, social-psychological factors, behavioural change stage model, behavioural economics.
<b>JEL Code</b>	D91, Q15, Q54
<b>Introduction</b>	<b>100 – 250 words</b>
<p>Empirical evidence points to the complexity of farmers adoption behaviour towards environmentally friendly farming practices. Farmers' production choices and management decisions are not always exclusively based on economic incentives. For instance, a profitable and climate-friendly innovation is often not adopted by farmers. In practice, changes in behaviour can be limited by the role of habits and/or traditions, especially for lower-educated farmers (EC, 2018b). Additionally, other behavioural factors influence adoption behaviour, such as perceived risks, perceived control, perceived costs and benefits, knowledge, as well as social factors (need for social approval, status, social comparison and etc.) and less-salient dispositional factors (resistance to change, personality, risk tolerance, moral and environmental concerns and etc.) (Dessart, Barreiro-Hurlé, &amp; van Bavel, 2019).</p>	

The theory of planned behaviour is commonly used for analysing technology adoption in agriculture, but it has been criticized for ignoring time-related behavioural changes (Bamberg, 2013a) and its inability to predict the extent to which intention translates into behavioural change (Bamberg, 2013a; Bijttebier et al., 2018; Hijbeek et al., 2018; Werner et al., 2017). To address this problem, Bamberg, Fujii, Friman, and Gärling (2011) have proposed the self-regulated stage model of behavioural change (SSBC) as a new theoretical framework for understanding behavioural changes in different stages, and eliciting systematic interventions. In the SSBC, behavioural change toward pro-environmental behaviour takes place in four stages (pre-decisional, pre-actional, actional, and post-actional) which are affected by constructs taken from the norm-activation model and the theory of planned behaviour (Keller, Eisen, & Hanss, 2019). A recent review study lends empirical support the SSBC (Keller et al., 2019).

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## **Methodology**

**100 – 250 words**

This empirical study tests the influence of a rich set of social-psychological factors on individual farmer's stage affiliation using the SSBC model by applying an ordered probit regression. Online surveys based on the SSBC were disseminated via specialised dairy farmers registered with the Dutch Farm Accountancy Data Network (FADN) between 28 July 2021 and 16 September 2021. In total, 300 farmers received the survey; 122 farmers replied and 108 complete records were used for data analysis.

Survey questions were formulated based on previous literature (Bamberg, 2013a, 2013b; Ohnmacht, Thi Thao, Schaffner, & Weibel, 2018) and adapted to the context of adopting climate mitigation measures in the Dutch dairy sector. Participants were asked to what stage of the behavioural change they would assign themselves. In addition, socio-psychological factors were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Matching socio-demographic data of survey participants is provided by Wageningen Economic Research which is responsible for the Dutch FADN data collection.

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## **Results**

**100 – 250 words**

From our sample of 108 specialised Dutch dairy farmers, 53% has already taken measures to reduce on-farm GHG emissions (post-actional stage); 33% is not sure about how and when to adopt climate mitigation measures although they would like to reduce on-farm GHG emissions (pre-actional stage); 7% already knows which measures to apply, but has not put it into practise yet (actional stage); and 6% does not plan to take any measures (pre-decisional stage).

Cronbach's alpha and average inter-item correlation are used to estimate the reliability of the latent variable with two sub-indicators, consisting of social norm, personal norm, attitude and perceived behavioural control. An acceptable Cronbach's alpha is larger than 0.7 according to Nunnally (1978). In our sample, only personal norm is acceptable. However, Cronbach's alpha depends to a large extent on the total number of sub-indicators per latent variable. Given that we only have two sub-indicators per latent construct, it is also recommended by Pallant (2013) to check the inter-item correlation for the sub-indicators. The acceptable range for inter-item correlation is 0.2 to 0.4. These four latent constructs measured with two sub-indicators are reliable based on inter-item correlations. Moreover, we calculate correlations between all socio-

psychological factors. There is no correlation greater than Pearson  $r = 0.7$ . Hence, we can ignore the multicollinearity when interpreting the modelling results.

Our findings suggest that it is mainly negative emotion associated with taking no climate mitigation measures and the perceived goal feasibility having a significant positive impact on farmers' stage affiliation of adopting climate mitigation measures at  $p < 0.05$ . Additional coping planning and maintenance self-efficacy are statistically significant at  $p < 0.1$ . Positive emotion, social norm, personal norm, attitude, perceived behavioural control, action-planning, coping-planning, maintenance self-efficacy and recovery self-efficacy are not significant explanatory variables for this empirical study.

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### **Discussion and Conclusion**

**100 – 250 words**

This empirical study also suggests an orientational design of policy interventions. For further motivating Dutch dairy farmers' mitigation efforts regarding GHGs emissions, policy makers could consider making farmers' negative emotions with taking no climate mitigation measures more salient, as well as strengthening their perceived goal feasibility for reducing farming related GHGs emissions.

Word count: 52

Total word count: 967

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