Is there a "European model" for agricultural anaerobic digestion? A state of the art based on the international social science literature

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Abstract

Based on a review of the international social science literature, this paper asks the question of whether there is such a thing as a "European model" for agricultural anaerobic digestion. The corpus, compiled between February and March 2024, initially included 113 papers written in English and French, selected among the 28,973 results from 13 databases (Cairn, Érudit, Gallica, HAL, Jstor, OpenEdition, Persée, Sage, ScienceDirect, SocIndex, SpringerLink, WebOfScience, Wiley). An advanced keyword research (using the keyword "méthanisation agricole" for French-language databases and "agricultural biogas" or "agricultural anaerobic digestion" for English-language databases) was used to find the most relevant papers dealing with on-farm anaerobic digestion in Europe from a social science perspective. After reading them, we selected 38 papers in English and 35 papers in French and studied them using a detailed thematic analysis grid, from which six main research questions emerged, which we will explore in this paper.
To look beyond the general expressions of support for renewable energies in European public opinion, it is interesting to explore: (i) On the one hand, the social acceptability of agricultural biogas plants, which depends on the diverse interests of the stakeholders involved and their divergent internalized perceptions and values. The acceptability of biogas plants needs to be studied first in relation to localised issues and interconnected social and spatial factors. (ii) On the other hand, controversies have especially arisen over the production of energy crops (instead of food crops?), reflecting the priority given to the energy transition over the ecological transition.

Given that most anaerobic digestion plants are small-scale on-farm installations, it is crucial to pay attention to the farms' territorial location and to the interactions between the stakeholders involved. Two main issues thus need to be studied: (iii) the position of farmers in the face of industrial developments in the biogas sector, and (iv) the relation between on-farm anaerobic digestion and local rural development.

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These first two series of questions invite reflection on a third point: the development of agricultural anaerobic digestion is part of ongoing processes, showing that these technologies are embedded in society and dependent on political and economic regulations (v) which can act either as levers or barriers (see the role of public subsidies and the (poor?) economic performance of anaerobic digestion for farmers).

This will lead us to conclude by addressing (vi) the sustainability issues related to anaerobic digestion, which have not been considered to the same degree in future studies, from which no clear blueprint can thus be derived.
Agricultural anaerobic digestion thus appears to be a boundary object, situated at different – global/local, European/national/regional - levels of understanding and action, and involving different social players and sectors (energy, food, farming, local development, etc.) working together to face sustainability challenges.

Keywords: Agricultural anaerobic digestion, renewable energy, biogas, sustainable agriculture, rural development, viability, social sciences review, Europe