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On-farm renewables and resilience: a water-energy-food nexus case study

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On farm renewables diversify farm income sources (or reduce energy costs) and are thus generally considered to increase farm resilience. Whilst they clearly contribute to renewable energy production targets they can also affect water quality either positively (e.g. use of farmyard manure for anaerobic digestion) or negatively (particularly during construction). Here the interactions within the water-energy-food nexus are examined as they relate to on-farm renewables, where possible quantifying the relative magnitude of feedbacks between the three sectors. Particular focus is given to the dynamics of the system in changing climatic conditions. These analyses reveal a complex picture, with trade-offs between the 'resilience' in different parts of the nexus. This highlights the need for dialogue between stakeholders to identify the key functions in each sector that would be susceptible to particular climatic stresses so that these can be prioritised during planning.