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Research topic: Determinants of willingness to participate in renewable energy PES program in China

## Abstract

While many determinates of participation in Payments for ecosystem services (PES) programs has been investigated, little is known about the impacts of risk, ambiguity and time preferences. We explore the roles of risk, ambiguity and time preferences in participation in PES programs, using a case study of the rural biogas program supported by Government Bond Funds in China. The biogas is produced from organic wastes and can substitute other energy materials for heating and lighting, which makes it very helpful in reducing CO<sub>2</sub> emissions and protecting forest lands. To promote the development of biogas in rural China, central Chinese government launched the rural biogas program supported by Government Bond Funds in 2003. In the program participants receive governmental payments (subsidies) to build biogas pools, and they are responsible for using biogas in daily lives. Until 2010, there are 41 million households having biogas pools in China, accounting for 30% of suitable households. There are still large rooms for the development of biogas. Attracting more participants becomes a key factor for the success of the biogas program. To do this, the first step is to find out what factors affect farmers' willingness to participate in the biogas program.

In addition to a survey collecting characteristics of individuals and households, several experimental methods are employed to elicit the parameters of risk, ambiguity and time preferences. we find that comparing to ambiguity and time preferences, risk preferences play more important role. Farmers who are more risk averse in experiments are less willing to participate in the biogas program. The influence of risk preferences are only significant for impatient people, suggesting an interaction of risk and time preferences.

The biogas program is a government PES program, so the research is closely linked to the government. First, the goal of the research is to identify what factors affect farmers' willingness to participate in the biogas program, and provide policy suggestions to the government based on the results. Second, in the process of conducting the field work, we need help of government officials in obtaining detailed information on the program and respondents. Third, findings in the research have useful policy implications. For policy makers, the distinguish between risk and ambiguity preferences is helpful for the design of policies. If risk preferences have influence, policies that help farmers to reduce their perceptions of risk should be implemented (e.g., minimising risks of technologies, organising risk management training, designing particular kind of insurances). If ambiguity preferences are the key factors, policy makers should make efforts to delivery more information about the technology and program to farmers to reduce the ambiguity. For the biogas program, policy suggestions relating to reduce the risk need to be given to the government.