THE ROLE OF PERSONALITY TRAITS IN RENEWABLE ENERGY TECHNOLOGY ADOPTION: A CASE STUDY FROM CHINA

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(1) Overview

Biogas is a renewable energy source with several advantages (e.g., reducing CO_2 emissions). To speed up the development of biogas in rural China, the central Chinese government is implementing a rural biogas program through all the provinces of Mainland China. The program annually receives a governmental investment of ¥2.5 billion, and subsidises participants to build the biogas pools. More than half of suitable households have no biogas pool in rural China, and that makes it important to understand what factors play a role in renewable energy technology adoption. In addition to the factors examined in previous studies such as gender, education, and income, I further investigate the role of personality traits in renewable energy technology adoption. Personality traits are theoretically linked to technology adoption (Rogers, 1995). However, to the best of my knowledge, personality traits have never been quantitatively analysed in empirical studies on renewable energy technology adoption. In the theoretical model of technology adoption, factors affect adoption through the intention to adopt, which has a strong positive relationship with adoption (Ajzen, 1991). This study investigates how individuals' personality traits affect their intentions to adopt biogas as a way to explore the role of personality traits in renewable energy technology adoption.

(2) Methods

Two indicators, the Big Five and locus of control, are used to measure individuals' personality traits. The Big Five capture the five basic dimensions of personality: neuroticism, extraversion, openness, agreeableness and conscientiousness (Costa and McCrae, 1992, McCrae and John, 1992). Neurotic people are anxious, nervous, and depressing. Extraverted people are talkative, sociable, and outgoing. Open people are creative, perceptive, and imaginative. Agreeable people are kind, caring, and considerate. Conscientious people are thorough, efficient, and organised. Locus of control captures how people interpret the results of events they experience (Rotter, 1966). People with an internal locus of control think that the results are determined by their own behaviours or characteristics. People with an external locus of control believe that the results are determined by external factors (e.g., fate, chance, and luck) beyond their control. In the survey, I use a short questionnaire with 25 items to measure individuals' Big Five and locus of control. The questionnaire is developed from original questionnaires by Costa and McCrae (1985), John et al. (1991), and Rotter (1966). Figure 1 shows a model of the hypothetical relationships between personality traits and intentions to adopt, based on the findings in previous studies (e.g., Devaraj et al., 2008; Maybery and Crase, 2004). In addition to the direct impact, personality traits may indirectly affect intentions to adopt through perceived ease of use of the technology and/or through risk preferences.

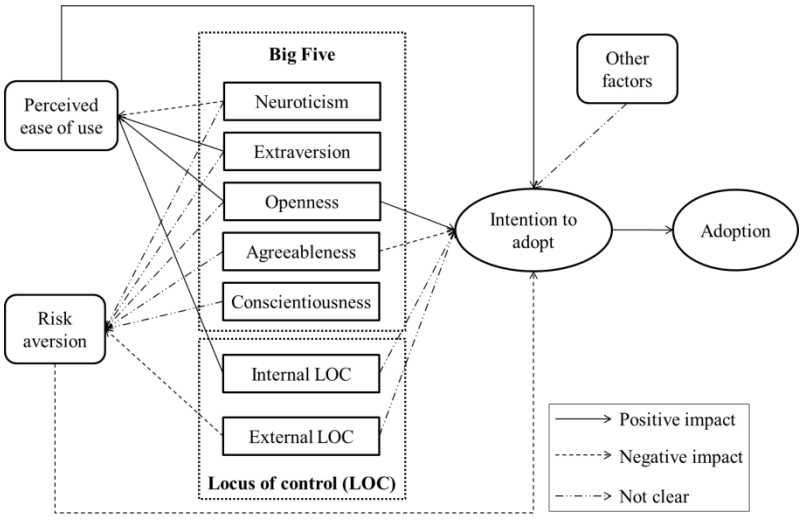

Fig.1: The research model

(3) Results

Figure 2 displays the results. Agreeableness, internal locus of control, and external locus of control directly affect intentions to adopt biogas. Farmers with a higher level of internal locus of control, and lower levels of external locus of control and agreeableness are more likely to have intentions to adopt biogas. Neuroticism, openness, and external locus of control indirectly affect intentions to adopt biogas through perceived ease of use, not via risk preferences. Farmers with higher levels of neuroticism, openness, and external locus of control are more likely to think that it will be easy to use biogas. I also find gender differences in the effects of openness and internal locus of control on intentions to adopt. Specifically, both openness and internal locus of control play a more important role for men.

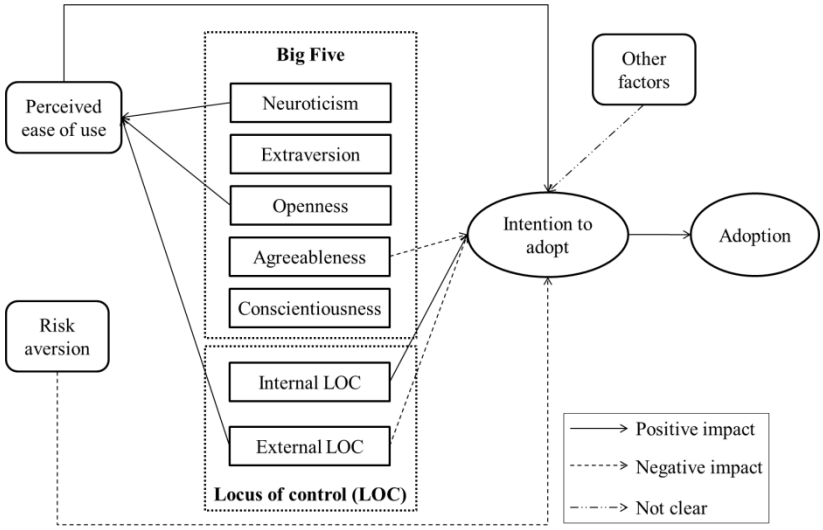

Fig. 2: The role of personality traits in biogas adoption

(4) Conclusions

In this study, I find that farmers' personality traits affect their intentions to adopt biogas. These findings highlight the importance of incorporating personality traits into the research on renewable energy technology adoption. The effects of different personality traits on intentions to adopt biogas differ in sign and channel, and this suggests that people with different personality traits should be encouraged to adopt renewable energy technologies with different approaches. This study uses the Big Five and locus of control as indicators of personality traits, and examines two channels, perceived ease of use and risk preferences, through which personality traits may affect intentions to adopt renewable energy technologies. Future research could investigate whether other personality traits and channels also play a role in renewable energy technology adoption.

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