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节水灌溉技术社会生态效益评估 ——以石羊河下游民勤县为例

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摘要:节水灌溉技术的社会生态效益评估是相关政策制定的重要参考依据。本文以甘肃省石羊河下游民勤县为例,基于选择实验法构建了节水灌溉技术的效益评估框架,并通过问卷设计、选择实验调研和Mixed Logit模型估计,测算了技术采用效益。结果显示,民勤县居民已经形成了一定的社会生态认知,以期通过相应的治理措施来保障区域生态环境的稳定;城镇居民平均每户愿意为当地社会生态环境的改善支付657.21元/年,高于农村居民的587.06元/年;未来10年,民勤县实施节水灌溉技术的社会生态效益总量为3.946亿元,单位播种面积的节水效益总量为7674元/hm²。此外,本文还进一步探讨了运用选择实验法量化节水灌溉技术采用效益的优势与不足,并指出了进一步研究中需要重点关注的一些问题。

关键词:节水灌溉技术;社会生态效益;非市场价值;选择实验法;Mixed Logit模型;民勤县

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Social and ecological benefits evaluation of water-saving irrigation technology adoption in Minqin County

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Abstract: An effective way to improve policy sustainability and rationality is via scientifically quantifying non-market social-ecological benefits brought by water-saving irrigation technology. Here, we take Minqin county, downstream of the Shiyang River, as an example, and designed and implemented choice experiments based on a benefit evaluation framework and index system. We then estimated the social-ecological benefits of technology water-saving irrigation adoption using a mixed logit model. The results show that residents of Minqin have formed the cognition of ecological protection, and they expect to take necessary measures to ensure the stability of the ecology and environment. The average willingness to pay for urban households is 657.21 CNY/year, and the average willingness to pay for rural household is 587.06 CNY/year, under the assumption that the ideal level of socio-ecological indicators can be reached through water-saving irrigation technology adoption in the next 10 years. We calculated that water-saving irrigation technology adoption could bring 394.6 million CNY of social-ecological benefits for county residents in the next 10 years, and total the benefits per unit area of farmland is 7674 CNY in Minqin. We point out that choice experiment methods have advantages of reducing measurement bias, acquiring more preference information, and also dealing with multi-index questionnaires more flexibly. However, in terms of selecting evaluation indicators, setting indicator levels, and measuring social-ecological benefits of a wider range of residents in the surrounding areas, more thorough work is needed.

Key words: water-saving irrigation technology; social-ecological benefits; non-market value; choice experiment; Mixed Logit model; Minqin County