Supplementary Survey Instruments and Protocols

This file is prepared as anonymised supplementary material for double-blind peer review.

1. Overview of the survey instrument

This supplementary file provides the household questionnaire used in this study, together with the survey protocol, informed consent statement, and data anonymisation procedure. The questionnaire was designed to collect residents' perceptions of the heritage value of the Liyun River–Gaoyou Irrigation District and the development of rural human settlements. This file contains no author names, affiliations, funding information, institutional identifiers, respondent names, phone numbers, detailed household addresses, or other directly identifying information.

2. Survey protocol

The household questionnaire survey was conducted among residents of the sampled administrative villages selected from the 89 village-level units included in the study. Participation was voluntary. Before completing the questionnaire, participants were informed of the research purpose, the anonymous nature of the survey, and the academic use of the data. The questionnaire included demographic questions, residents' perceptions of irrigation heritage functions and heritage value, and evaluations of village development and rural human settlement quality.

3. Consent procedure

Informed consent was obtained before questionnaire completion. By participating in the survey, respondents agreed that their anonymised responses could be used for academic research. No directly identifiable personal information, such as names, phone numbers, identity numbers, or detailed household addresses, was collected.

4. Data anonymisation and processing

All questionnaire responses were anonymised before analysis. The shared dataset contains anonymous response IDs only. Individual responses were aggregated to the village level where required for indicator construction. Blank or invalid responses were excluded from the corresponding village-level mean calculation. The coding scheme for each questionnaire item is provided in the Questionnaire_codebook sheet of Supplementary_Raw_Materials_DBPR.xlsx.

5. Relationship with other supplementary materials

The questionnaire items correspond to the questionnaire codebook and aggregated survey data provided in Supplementary_Raw_Materials_DBPR.xlsx. The AHP, entropy, and combined weighting procedures are also provided in that workbook. This file focuses on the household survey instrument, informed consent information, survey protocol, and anonymisation procedure; identifiable expert records or personal information are not included.

6. Household questionnaire / 居民调查问卷

Research Title / 研究题目: Study on the Heritage Value of Liyun River–Gaoyou Irrigation District and the Development of Rural Human Settlements / 里运河—高邮灌区遗产价值与乡村人居环境发展研究

Dear Participants / 尊敬的先生/女士: The Liyun River–Gaoyou Irrigation District is a vital traditional irrigation system in China and was inscribed on the World Heritage Irrigation Structures (WHIS) list in 2021. This study aims to understand the relationship between irrigation heritage conservation and rural development. All data are anonymous and used strictly for academic research. / 里运河—高邮灌区是我国重要的传统灌溉工程，并在 2021 年入选"世界灌溉工程遗产"名录。本研究旨在了解灌区遗产保护与乡村发展的关系。本问卷采用匿名方式，所有数据仅用于学术研究。

Part I. Demographic Information ／ 第一部分：个人基本信息

Q1_Gender. Gender / 您的性别

□ Male / 男
□ Female / 女

Q2_Age. Age / 您的年龄

□ Under 18 / 18 岁以下
□ 18-35 / 18-35 岁
□ 36-50 / 36-50 岁
□ 51-65 / 51-65 岁
□ Over 65 / 65 岁以上

Q3_Residence_length. Length of residence / 您在本地连续居住时间

□ ≤ 5 years / 5 年及以下
□ 6-10 years / 6-10 年
□ 11-20 years / 11-20 年
□ > 20 years / 20 年以上

Q4_Education. Education / 您的最高教育程度

□ Primary school or below / 小学及以下
□ Junior high school / 初中
□ Vocational school / 中专
□ Senior high school / 高中
□ Junior college / 大专
□ Bachelor's degree / 本科
□ Master's degree or above / 硕士及以上

Q5_Income_sources. Main sources of personal income / 您个人的主要收入来源 [Multiple choice / 多选题]

□ Agricultural planting / 农业种植
□ Aquaculture / 水产养殖
□ Local industrial labor / 本地工业务工
□ Tourism services / 旅游服务
□ Migrant labor / 外出打工
□ Self-employment / 个体经营
□ Government subsidies / pension / 政府补贴/退休金
□ No fixed income / 无固定收入
□ Others / 其他 _____

Q6_Annual_income. Approximate personal annual income / 您的个人年收入大约为

□ No income / 无收入
□ 30,000 RMB or below / 3 万元及以下
□ 30,000-50,000 RMB / 3-5 万元
□ 50,000-100,000 RMB / 5-10 万元
□ Above 100,000 RMB / 10 万元以上

Part II. Irrigation heritage function, awareness, and participation ／ 第二部分：灌溉遗产功能、认知与参与

Q7_Irrigation_function. In recent years, has the irrigation function of this district or the Liyun River–Gaoyou Irrigation District operated well? (Stable water supply and timely delivery) / 近年来本灌区或者里运河—高邮灌区的灌溉功能是否运行良好？（灌溉用水较为稳定，供水及时）

□ Very Poor / 非常差
□ Poor / 比较差
□ Average / 一般
□ Good / 比较好
□ Very Good / 非常好

Q8_Navigation_function. In recent years, has the navigation function of this district or the Liyun River–Gaoyou Irrigation District operated well? (Refers to navigation in channels other than the Grand Canal/Liyun River and Gaoyou Lake) / 近年来本灌区或者里运河—高邮灌区的航运功能是否运行良好？（除大运河/里运河、高邮湖外，其他渠道的航运功能）

□ Very Poor / 非常差
□ Poor / 比较差
□ Average / 一般
□ Good / 比较好
□ Very Good / 非常好

Q9_Flood_control_drainage. In recent years, has the flood control and drainage function of this district or the Liyun River–Gaoyou Irrigation District been effective? / 近年来本灌区或者里运河—高邮灌区的防洪排涝功能是否良好？

□ Very Poor / 非常差
□ Poor / 比较差
□ Average / 一般
□ Good / 比较好
□ Very Good / 非常好

Q10_Maintenance_status. In recent years, has the maintenance of sluice stations and channels in this district or the Liyun River–Gaoyou Irrigation District been good? (Including dredging, repair, inspection frequency, and maintenance response time) / 近年来本灌区或者里运河—高邮灌区的闸站和渠道维护状况是否良好？（包括清淤、维修、巡检频率、维修响应时间）

□ Very Poor / 非常差
□ Poor / 比较差
□ Average / 一般
□ Good / 比较好
□ Very Good / 非常好

Q11_Resident_participation_heritage_management. Have residents participated in the maintenance, protection, promotion, or management of the Liyun River–Gaoyou Irrigation Heritage? / 村民是否参与过“里运河—高邮灌区遗产”的维护、保护、宣传或管理工作？

□ Never / 从未参加
□ Rarely / 很少参加
□ Occasionally / 偶尔参加
□ Frequently / 较多参加
□ Very Frequently / 经常参加

Q12_Heritage_awareness. Do you understand the Liyun River–Gaoyou Irrigation Heritage? (e.g., origins, historical and cultural stories, heritage knowledge, traditional technical wisdom, etc.) / 您是否了解“里运河—高邮灌区遗产”？（如来历、历史文化故事、遗产知识、传统技术智慧等）

□ Completely Unaware / 完全不了解
□ Not very aware / 不太了解
□ Average / 一般
□ Well-aware / 比较了解
□ Very well-aware / 非常了解

Q13_Perceived_heritage_importance. Do you think the Liyun River–Gaoyou Irrigation Heritage is important to the local area? / 您觉得“里运河—高邮灌区遗产”对本地来说重要吗？

□ Not important at all / 完全不重要
□ Not very important / 不太重要
□ Average / 一般
□ Important / 比较重要
□ Very important / 非常重要

Q14_Support_public_funding. Do you support the government allocating a portion of tax revenue for the protection, maintenance, and promotion of the Liyun River–Gaoyou Irrigation Heritage? / 您是否支持政府将部分税收用于“里运河—高邮灌区遗产”的保护、维修和宣传？

□ Do not support at all / 完全不支持
□ Do not support very much / 不太支持
□ Average / 一般
□ Support / 比较支持
□ Highly support / 非常支持

Q15_Cultural_activity_participation. Have residents participated in cultural activities related to the Liyun River–Gaoyou Irrigation District? (e.g., special festivals, traditional customs, sightseeing, study tours, etc.) / 村民是否参加过里运河—高邮灌区相关的文化活动？（如特色节庆、习俗活动、观光研学等）

□ Never / 从未参加
□ Rarely / 很少参加
□ Occasionally / 偶尔参加
□ Frequently / 较多参加
□ Very Frequently / 经常参加

Part III. Village development and rural human settlement perceptions / 第三部分：村庄发展与乡村人居环境感知

Q16_Village_economic_development. How would you evaluate the overall economic development of your village? / 您觉得村子的整体经济发展状况如何？

□ Very Poor / 非常贫穷
□ Poor / 贫穷
□ Average / 一般
□ Wealthy / 富有
□ Very Wealthy / 非常富有

Q17_Village_preference. As a local resident, do you like the village where you currently live? / 作为本地居民，您喜欢现在居住的村子吗？

□ Dislike very much / 非常讨厌
□ Dislike / 讨厌
□ Average / 一般
□ Like / 喜欢
□ Like very much / 非常喜欢

Q18_Village_management_satisfaction. Are you satisfied with the current management of the village? / 您对当前村里的管理满意吗？

□ Very dissatisfied / 非常不满意
□ Dissatisfied / 不满意
□ Average / 一般
□ Satisfied / 满意

□ Very satisfied / 非常满意

Q19_Ecological_environment_quality. How would you evaluate the quality of the ecological environment in your village? (e.g., whether the water, green spaces, and air are good, comfortable, and clean during your daily life and farming, and their impact on life and production) / 您觉得村子的生态环境质量如何？（比如您平时生活和种地时，周围的水、绿地、空气这些环境好不好、舒不舒服、干不干净，对生活和生产有没有影响）

□ Very Poor / 非常差
□ Poor / 比较差
□ Average / 一般
□ Good / 比较好
□ Very Good / 非常好

Informed Consent / 知情同意: By participating in this survey, you agree that your anonymised data will be used for academic research. / 参与本调查即表示您同意将匿名数据用于学术研究。

Thank you for your participation! / 感谢您的参与！

Note for reviewers: The corresponding variable names, coding rules, missing-value treatment, and aggregation methods are provided in the Questionnaire_codebook sheet of Supplementary_Raw_Materials_DBPR.xlsx.