Heterogeneous valuation and eco-efficiency of Laser Land Leveling in paddy production in the Mekong Delta

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Associated documentation

Laser land leveling technology for paddy production in Vietnam.pdf *(1.15 MB)*

readme.txt *(916 bytes)*

Variable list.xlsx *(45.99 KB)*

Citation

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Alternative title

Heterogeneous valuation and eco-efficiency of Laser Land Leveling in paddy production in the Mekong Delta

Creator/Principal investigator(s)

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Research principal

University of Gothenburg - Environment for Development, School of Business, Economics and Law

Principal's reference number

MS -546

Description

This dataset surveys the demand for land leveling by laser (LLL) services of the paddy growing farmers in the Mekong Delta provinces, Vietnam. Demographic characteristics of farmers, cultivated area, characteristics of land plot and rice cultivation process of households were reported. Using the auction method, farmers chose different levels of willingness to pay (WTP) for LLL service rental for each rice plot. The data represents for factors affecting WTP level were also collected to obtain necessary information for random control trial (RCT) research. We also collected the data on the rice cultivation regarding yield and inputs in the year from 2019 to 2022.
Vietnam, has been the second largest rice exporter in the world with 14% of global rice export volume in 2021. The impacts of climate change are regarded as the most significant challenge to agricultural production in Vietnam, especially for paddy production, as the country ranks sixth among the top 10 most at-risk nations globally. Besides, Vietnamese rice farmers encounter challenges of low productivity, fragmented cultivation areas, and inefficient use of inputs. The reduction in rice cultivation areas is projected to continue in Vietnam and other Asian countries Therefore, there is an urgent need to promote the adoption of sustainable agricultural technologies to ensure resilient and sustainable agricultural systems, particularly in paddy cultivation, amid a changing climate.
The rising prevalence of land fragmentation, especially in developing regions, introduces new

challenges that remain largely unexplored. This dataset was collected to investigate how land fragmentation influences demand for precision agricultural technology and the policy challenges regarding fragmented landscapes.

Data contains personal data

Yes

Type of personal data

District, commune, village, age, sex, years of schooling, household size

Language

English

Unit of analysis

Household

Population

This data surveys the demand for land leveling by laser (LLL) services of the paddy growing farmers in the Mekong Delta provinces, Vietnam. Demographic characteristics of farmers, cultivated area, characteristics of land plot and paddy cultivation process of households were reported.

Time Method

Other

Sampling procedure

Other

For the selection of the primary data sample, the cluster sampling technique was employed. Particularly, An Giang and Kien Giang provinces were selected as the sites for this empirical study due to their prominence in paddy cultivation, encompassing the largest cultivation areas among the 13 provinces of the Mekong Delta. In addition, An Giang's long-established rice farming tradition has led to a landscape characterized by smaller, carefully leveled fields, while Kien Giang, where paddy farming has been adopted more recently, is marked by larger fields shaped through ongoing land reforms. This contrast highlights the variation in soil types and intensive cropping systems, differences in freshwater availability, the utilization of technology, and irrigation management—whether managed individually or cooperatively (GSO, 2023). These provinces also demonstrate variations in topographical flatness, which acts as an indicator of the suitability for technology implementation, as well as in agricultural extension programs. These are important factors in the analysis of water efficiency resulting from the LLL technology adoption. Two communes were selected in each province in compliance with two distinct criteria. Firstly, at the time of the study in 2020, the LLL technology had not been broadly adopted as a common practice in the paddy field. Secondly, a significant proportion of farmers own plots larger than 1000 m2, the minimum size necessary for the LLL service implementation. For each commune, 75 farmers were randomly chosen in accordance with two previously defined criteria. We conducted seminars to introduce LLL technology. From an attendee list of approximately 100 farmers per commune, we selected participants on a rotating basis, choosing three for every one omitted. A total of 303 households, encompassing 764 paddy fields, were interviewed to conduct a BDM auction to select 201 winning plots based on a predetermined price. Finally, 97 plots were randomly allocated to either the treatment or control group via a lottery system. These 97 plots were investigated for their irrigation

management, including irrigation water volumes, net water use, drainage practices, input applications, and other relevant data during the three winter–spring crops in 2020, 2021, and 2022.

Time period(s) investigated

2019-12 – 2022-02

Variables

606

Number of individuals/objects

303

Response rate/participation rate

100%

Data format / data structure

Other

Data collection 1

- Mode of collection: Interview
- Description of the mode of collection: After collecting information from paddy households, the research team adjusted and supplemented paddy production targets according to the converted area of 1 hectare, entered data into Microsoft Excel and analyzed data using statistical other software.
- Time period(s) for data collection: 2019-12-25 – 2022-02-15
- Data collector: University Of Economics Ho Chi Minh City, Vietnam
- Instrument: Semi-structured questionnaires (Questionnaire) - The semi-structured questionnaire included the demographic characteristics of households, paddy farming characteristics, demand of LLL services and other related information.
- Sample size: 303
- Source of the data: Research data

Geographic spread

Geographic description: An Giang and Kien Giang provinces of Vietnam are chosen for survey since these provinces are the major paddy production and well represent paddy farming systems different in fresh water availability and technology adoption in the Mekong Delta region.

Lowest geographic unit

Region

Highest geographic unit

Region

Responsible department/unit

Environment for Development, School of Business, Economics and Law

Commissioning organisation

University of Economics Ho Chi Minh City, Vietnam

Research area

Other agricultural sciences not elsewhere specified (Standard för svensk indelning av forskningsämnen 2011)

Agriculture and rural industry (CESSDA Topic Classification)

Keywords

Eco-efficiency

Publications

Loan T. Le, Luan D. Tran, Trieu N. Phung. Laser land leveling technology for paddy production in Vietnam: impact on efficient irrigation and water conservation. Environ Monit Assess (2025) 197:17, https://doi.org/10.1007/s10661-024-13509-x
DOI: https://doi.org/10.1007/s10661-024-13509-x

Point (Lon/Lat)

105.169318, 10.560086

Point (Lon/Lat)

105.167081, 10.566161

Point (Lon/Lat)

105.257829, 9.520213

Point (Lon/Lat)

105.167081, 10.566161

Accessibility level

Access to data through SND
Access to data is restricted

Use of data

Things to consider when using data shared through SND

License

Versions

Version 1. 2025-02-11

Contacts for questions about the data

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Download metadata

DataCite

DDI 2.5

DDI 3.3

DCAT-AP-SE 2.0

JSON-LD

PDF

Citation (CSL)

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