

**PREDICTING AGRICULTURAL LAND CONVERSION
AND SOCIO-ECONOMIC DISPLACEMENT
INDUCED BY HIGH-SPEED RAIL STATION DEVELOPMENT
(Case Study: Tegalluar Station, West Java)**

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BOGOR
2026**



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ABSTRACT

MAHDI FAJRI. Predicting Agricultural Land Conversion and Socio-Economic Displacement Induced by High-Speed Rail Station Development (Case Study: Tegalluar Station, West Java) (undergraduate thesis). Advised by SETYARDI PRATIKA MULYA and ERNAN RUSTIADI

Large-scale infrastructure such as the Jakarta–Bandung High-Speed Railway simultaneously stimulates regional growth while disrupting agrarian peri-urban communities. At Tegalluar Station, advancing Transit-Oriented Development and Technopolis policies further threaten traditional farming livelihoods through accelerated land conversion. Employing a mixed-methods approach integrating multi-temporal spatial analysis (2016–2026), Cellular Automata-Markov Chain modelling, and NVivo-analyzed qualitative fieldwork, this study systematically tracks multitemporal and spatiotemporal land transitions and the socio-economic displacement of surrounding traditional agrarian communities. Spatial analysis reveals agricultural land contracted from 78.40% to 62.83% between 2016 and 2026, while built-up areas expanded from 13.85% to 23.33%, concentrated within a 0.2-kilometre radius of the station. Qualitative findings expose involuntary resettlement, rising living costs, and adaptive shifts toward formal employment. Regulatory conflicts between TOD initiatives and the Sawah Abadi preservation policy further compound conversion pressures. CA-Markov projections forecast agricultural land declining to 46.39% and built-up environments expanding to 42.76% by 2036, offering policymakers a forward-looking framework for balancing urbanisation with sustainable regional planning.

Keywords: High-Speed Rail, Agricultural Land Conversion, CA-Markov, NVivo, Agrarian Livelihoods, Predictive Spatial Modelling.

ABSTRAK

MAHDI FAJRI. Prediksi Konversi Lahan Pertanian dan Ketergusuran Sosial-Ekonomi yang Dipicu oleh Pembangunan Stasiun Kereta Cepat (Studi Kasus Stasiun Tegalluar, Jawa Barat) (skripsi). Dibimbing oleh SETYARDI PRATIKA MULYA dan ERNAN RUSTIADI.

Infrastruktur berskala besar seperti Kereta Cepat Jakarta-Bandung secara bersamaan mendorong pertumbuhan wilayah sekaligus mengganggu tatanan masyarakat peri-urban agraris. Di Stasiun Tegalluar, dorongan kebijakan *Transit-Oriented Development* (TOD) dan *Technopolis* semakin mengancam mata pencaharian pertanian tradisional melalui percepatan konversi lahan. Dengan menggunakan pendekatan metode campuran yang mengintegrasikan analisis spasial multitemporal (2016–2026), pemodelan *Cellular Automata-Markov Chain* (CA-Markov), dan penelitian lapangan kualitatif yang dianalisis dengan NVivo, studi ini secara sistematis melacak transisi lahan spasiotemporal dan ketergusuran sosial-ekonomi dari komunitas petani di sekitarnya. Analisis spasial mengungkapkan bahwa lahan pertanian menyusut dari 78,40% menjadi 62,83% antara tahun 2016 dan 2026, sementara kawasan terbangun meluas dari 13,85% menjadi 23,33%, yang terkonsentrasi dalam radius 0,2 kilometer dari stasiun. Temuan kualitatif mengungkap adanya permukiman kembali secara paksa (*involuntary resettlement*), peningkatan biaya hidup, dan pergeseran adaptif menuju pekerjaan formal. Konflik regulasi antara inisiatif TOD dan kebijakan pelestarian Sawah Abadi semakin memperburuk tekanan konversi lahan. Proyeksi CA-Markov memperkirakan lahan pertanian akan terus menurun hingga 46,39% dan kawasan terbangun akan meluas menjadi 42,76% pada tahun 2036, menawarkan kerangka kerja berwawasan ke depan bagi para pembuat kebijakan untuk menyeimbangkan urbanisasi dengan perencanaan wilayah yang berkelanjutan.

Kata kunci: Kereta cepat, Konversi lahan pertanian, CA-Markov, Nvivo, Masyarakat agraris, Model proyeksi spasial



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Undergraduate Thesis
As one of the requirements to obtain bachelor's degree at
Land Resource Management Study Program

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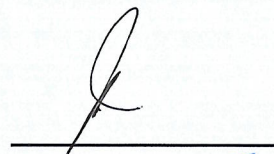
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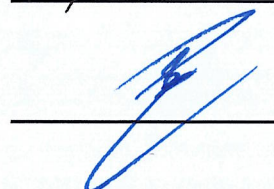
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PREFACE

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Hopefully this undergraduate thesis can be beneficial as how it is supposed to be for the policymakers, writer, reader, and for the advancement of knowledge.

Bogor, 28th of May 2026

Mahdi Fajri



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TABLE OF CONTENTS

TABLE OF CONTENTS	ix
LIST OF TABLES	x
LIST OF FIGURES	x
LIST OF APPENDICES	xii
I INTRODUCTION	1
1.1 Background	1
1.2 Problem Formulation	2
1.3 Research Objectives	3
1.4 Benefit	3
II LITERATURE REVIEW	4
2.1 Land Use and Land Cover Change (LUCC) and Agricultural Land Conversion	4
2.2 Transit-Oriented Development	5
2.3 Transit-Induced Urbanisation and Spatial Restructuring	5
2.4 Socio-Economic Implications of High-Speed Railway (HSR) Development for Local Livelihoods	6
2.5 Predictive Spatial Modelling	7
III METHODS	8
3.1 Study Location and Period	8
3.2 Tools and Material	8
3.3 Workflow	9
3.4 Data Collection	11
3.5 Data Analysis	12
IV General Overview of the Study Area	27
4.1 Area of The Study	27
4.2 Population of The Study Area	27
4.3 Landscape Characteristic of Study Area	28
4.4 Tegalluar Transit-Oriented Development (TOD) Area within the Context of Regional Spatial Planning (RTRW)	28
V RESULT AND DISCUSSION	30
5.1 Spatial Distribution of Land Cover Surrounding Tegalluar Station From 2016–2026	30
5.2 Multitemporal Analysis in Detecting Agricultural Land Conversion	33
5.3 Spatiotemporal Analysis by The Distance from Tegalluar Station	35
5.4 Socio-Economic Displacement Induced by The Development of Tegalluar	37
5.5 Policy Factors in Stimulating Agricultural Land Conversion	39
5.6 The Nexus of Socio-Economic Displacement, Policy, and Agricultural Land Conversion	41
VI CONCLUSION AND RECOMMENDATION	46
6.1 Conclusion	46



6.2	Recommendation	47
	REFERENCES	48
	APPENDICES	57
	BIOGRAPHY	68

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LIST OF TABLES

1	Datasets used in study	9
2	Characteristics of key informants	11
3	Correlation matrix of each objective, data analysis procedure, and output of this study	12
4	The administrative coverage of each buffer ring	14
5	Identified land cover classes and the reclassification	15
6	Structure of a confusion matrix with k categories	17
7	Qualitative data analysis framework and study applications	21
8	Driving and constraint factor input variables for CA-Markov predictive spatial modelling	24
9	Population of each villages surrounding Tegalluar Station	27
10	Confusion matrix of 2016 visual interpreted land cover classification	31
11	Confusion matrix of 2021 visual interpreted land cover classification	32
12	Confusion matrix of 2026 visual interpreted land cover classification	33
13	Land cover classification and distribution of Tegalluar Station's Neighbourhood Boundary 2016—2026	34
14	Spatial proxies and justification from qualitative findings	41
15	Land cover classification and distribution of Tegalluar Station's Neighbourhood Boundary 2031—2036	44

LIST OF FIGURES

1	Study area	8
2	Study workflow	10
3	Multitemporal analysis workflow for agricultural land conversion detection	19
4	General landscape characteristic of study area	28
5	Spatial delineation and regional spatial planning (RTRW) zoning of the Tegalluar TOD area	29
6	Land cover spatial distribution of the Tegalluar Station's neighbourhood boundary from 2016 to 2026	30
7	Spatiotemporal distance-decay effect of converted other cultivating land to built-up area	35
8	Spatiotemporal distance-decay effect of converted rice field to built-up area	36
9	Hierarchy chart of socio-cultural impact of Tegalluar Station Development	37
10	Hierarchy chart of economic displacement of Tegalluar Station Development	38

11	Hierarchy Chart of Policy factor in stimulating factor of agricultural land conversion	40
12	Predictive land cover spatial distribution within Tegalluar Station's neighbourhood boundary from 2031–2036	43

LIST OF APPENDICES

1	CA-Markov model cross-tabulation results	57
2	In-depth interview instruments	58
3	Codebook for thematic analysis	59
4	Thematic verbatim quotation for socio-cultural impact	62
5	Thematic verbatim quotation for economic impact (a)	62
6	Thematic verbatim quotation for economic impact (b)	63
7	Thematic verbatim quotation for economic impact (c)	63
8	Thematic verbatim quotation for economic impact (d) and policy and tenurial factor (a)	64
9	Thematic verbatim quotation for policy and tenurial factor (a)	64
10	Field documentation with sharecroppers	65
11	Field documentation with Head of Rancanumpang Village Government	65
12	Field documentation with a trader	65
13	Validation points spatial distribution of 2016 land cover classification	66
14	Validation points spatial distribution of 2021 land cover classification	66
15	Validation points spatial distribution of 2026 land cover classification	67