

CHAPTER 1: INTRODUCTION

A. Research Background

Agricultural transformation has become a global development priority in response to climate change, population growth, market integration, and rapid technological advancement. While traditional agricultural transformation mainly emphasized increasing productivity through mechanization and input intensification, contemporary transformation adopts a broader perspective that integrates economic efficiency, environmental sustainability, climate resilience, and rural livelihood improvement (FAO & OECD, 2025). Many countries are shifting from production-oriented agriculture toward sustainable agrifood systems that promote efficient resource use, low-carbon production, and resilient farming systems.

At the global level, several major trends characterize current agricultural transformation. These include the adoption of climate-smart and ecological farming practices, the application of digital technologies such as precision agriculture, artificial intelligence, and remote sensing, greater participation in agricultural value chains, and diversification of rural livelihoods. International organizations, including the FAO, OECD, and the World Bank, emphasize that future agricultural transformation should not only increase agricultural productivity but also improve farmers' resilience, environmental sustainability, and market competitiveness (World Bank, 2024; FAO & OECD, 2025). These global trends provide an important reference for countries developing agricultural policies that balance economic growth with climate adaptation and sustainable rural development, including Vietnam's agricultural transformation under Resolution 120/NQ-CP.

The Vietnamese Mekong Delta (VMD) is one of the world's most fertile and productive delta regions and serves as the most important agricultural production hub of Vietnam. Covering approximately 3.94 million hectares and supporting a population of nearly 18 million people, the region functions not only as the country's largest food-producing area but also as a major driver of agricultural development and export-oriented economic growth. According to the General Statistics Office (GSO, 2023) and the Ministry of Agriculture and Rural Development (MARD, 2023), the VMD contributes approximately 50% of Vietnam's total rice production, 65% of aquaculture production, 70% of fruit production, and more than 90% of the country's rice exports. Through these contributions, the Delta plays a fundamental role not only in ensuring national food security but also in supporting global food supply, particularly for many developing countries across Asia and Africa.

Beyond its economic significance, the Mekong Delta is home to nearly one-fifth of Vietnam's population, the majority of whom depend directly or indirectly on agriculture, fisheries, and related rural industries for their livelihoods. Millions of farming households rely on agricultural production as their principal source of income and employment. Although industrialization and urbanization have accelerated labor movement toward non-farm sectors, agriculture remains the backbone of the regional economy and rural society. Consequently, any changes in the agricultural production system have profound implications for household livelihoods, national food security, and the international competitiveness of Vietnam's agricultural sector.

Table 1.1. Socio-economic importance of the Vietnamese Mekong Delta

Indicator	Value
Total area	3.94 million ha
Population	Approximately 18 million people
Agricultural land	About 2.6 million ha
Contribution to national rice production	50%
Contribution to aquaculture production	65%
Contribution to fruit production	70%
Share of national rice exports	90%

Source: GSO (2023); MARD (2023).

Over the past three decades, the remarkable success of agriculture in the Mekong Delta has largely been driven by an extensive and intensive production strategy aimed at ensuring national food security. Following the *Doi Moi* economic reforms, the Government of Vietnam prioritized the expansion of rice cultivation, investment in irrigation infrastructure, flood control systems, the dissemination of high-yield rice varieties, and increased cropping intensity. These policies enabled Vietnam to transform from a food-deficit country into one of the world's three largest rice exporters (Pingali & Xuan, 1992; World Bank, 2016). At the same time, rural household incomes improved substantially, poverty declined significantly, and Vietnam strengthened its position in international agricultural markets.

Nevertheless, the production-oriented development model has gradually revealed significant limitations. Continuous triple-rice cropping and intensive farming have placed increasing pressure on land and water resources, resulting in soil degradation, biodiversity loss, environmental pollution caused by excessive use of fertilizers and pesticides, and increased greenhouse gas emissions from agricultural activities (FAO, 2018; Nguyen et al., 2019). Furthermore, this production model has reduced the diversity of farming systems, making rural households highly dependent on rice cultivation and increasingly vulnerable to market fluctuations and environmental shocks.

Against this backdrop, climate change has emerged as one of the most serious threats to the sustainable development of the Mekong Delta. According to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2022), the Mekong Delta is among the three most climate-vulnerable delta regions in the world, particularly with respect to sea-level rise. In recent years, the region has experienced prolonged droughts, increasingly severe saltwater intrusion, altered flood regimes, riverbank erosion, land subsidence, and more frequent extreme weather events. These climate-related impacts are further exacerbated by upstream hydropower development along the Mekong River, which has significantly reduced sediment transport and altered the natural hydrological regime of the basin (Renaud et al., 2015; Smajgl et al., 2015). Together, these environmental changes have reduced agricultural productivity, threatened freshwater availability, degraded ecosystem services, and weakened the adaptive capacity of rural communities.

In addition to environmental pressures, agriculture in the Mekong Delta is increasingly challenged by globalization and international market integration. Agricultural markets today no longer emphasize production volume alone but demand high-quality, safe, traceable, and environmentally sustainable products. The implementation of new-generation free trade agreements has created significant export opportunities while simultaneously imposing stricter standards regarding food safety, environmental certification, and product quality. Consequently, Vietnam's agricultural sector is required to shift from a quantity-based production model toward a value-driven development strategy that emphasizes technological innovation, digital transformation, ecological agriculture, and stronger integration into agricultural value chains.

Recognizing these systemic challenges, the Government of Vietnam promulgated Resolution No. 120/NQ-CP on Sustainable and Climate-Resilient Development of the Mekong Delta on 17 November 2017. This Resolution represents a landmark shift in regional

development policy and agricultural planning. Unlike previous policies that primarily emphasized maximizing rice production, Resolution 120 advocates a sustainable development approach based on the principle of "living with nature." Rather than attempting to control natural processes, the Resolution encourages adaptation to the ecological characteristics of each sub-region and promotes the efficient utilization of freshwater, brackish water, and saline water resources according to their comparative advantages.

After nearly a decade of implementing Resolution 120, farmers across the Vietnamese Mekong Delta have increasingly pursued diverse agricultural transformation pathways. These include land-use transformation, ecological and sustainable farming practices, livelihood diversification, digital agriculture adoption, and stronger integration into agricultural value chains. However, the pace and effectiveness of these transformation pathways remain highly uneven across provinces and farming households. While some households have rapidly adapted and successfully capitalized on new policy opportunities, others continue to rely on conventional farming systems or adopt only limited transformation measures. These differences suggest that agricultural transformation is neither uniform nor linear but is influenced by household livelihood assets, ecological conditions, technological readiness, institutional support, and market opportunities.

In response to these emerging challenges, the Government of Vietnam promulgated Resolution No. 120/NQ-CP on Sustainable and Climate-Resilient Development of the Vietnamese Mekong Delta in 2017, marking a fundamental shift in the country's agricultural development strategy. Unlike previous policies that primarily emphasized maximizing rice production and ensuring national food security, Resolution 120 introduces a new development paradigm based on the principle of "living with nature" (*thuận thiên*). The Resolution promotes agricultural restructuring toward ecological and climate-smart farming systems, crop and livelihood diversification, value-chain development, digital transformation, and sustainable natural resource management. These strategic priorities aim not only to enhance agricultural productivity but also to improve farmers' incomes, strengthen climate resilience, protect ecosystem services, and achieve balanced economic, social, and environmental development in the Mekong Delta (Government of Vietnam, 2017).

Today, Vietnam has entered a new era of agricultural development under the policy orientation of Resolution 120, in which sustainable agriculture has become the central objective of both national and regional development strategies. Agricultural transformation is no longer viewed simply as a change in cropping patterns or production systems but as a comprehensive

process involving technological innovation, institutional reform, market integration, environmental sustainability, and rural livelihood improvement. Consequently, understanding how agricultural transformation is occurring in practice and how it contributes to sustainable rural development has become increasingly important for policymakers, researchers, and development practitioners. Against this background, it is necessary to examine the current transformation process in the Mekong Delta and to identify the major challenges that remain in achieving the objectives of Resolution 120. These issues are discussed in the following section.

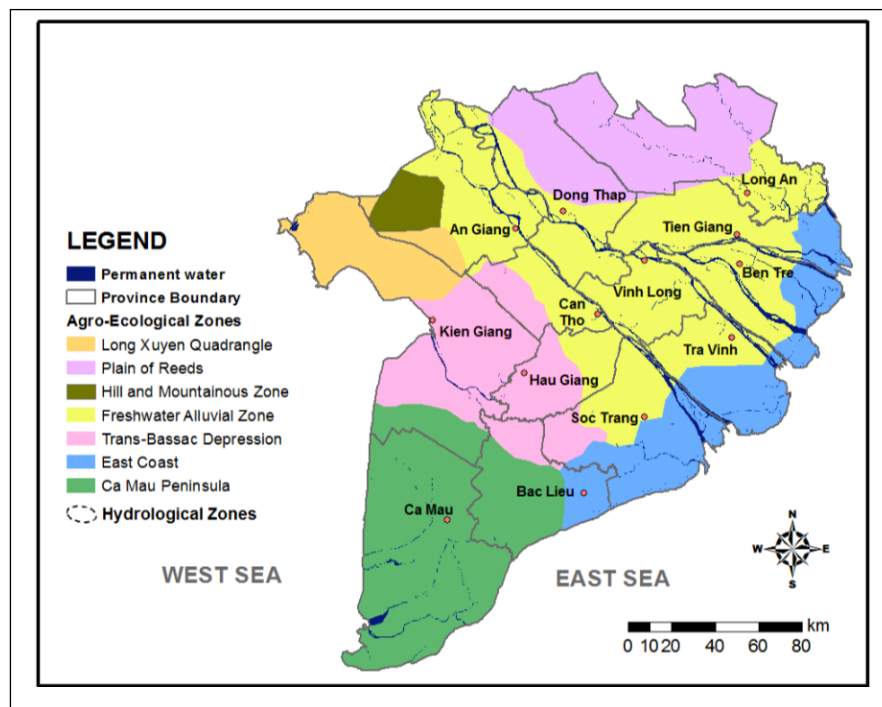


Figure 1.1 The Vietnamese Mekong Delta has agro-ecological zones

B. Problem statement

The promulgation of Resolution No. 120/NQ-CP on Sustainable and Climate-Resilient Development of the Vietnamese Mekong Delta in 2017 marked a fundamental turning point in Vietnam's agricultural development strategy. The Resolution shifted the policy orientation from maximizing agricultural production, particularly rice output, toward a more sustainable development model based on the principle of "*living with nature*" (*thuận thiên*). It promotes agricultural restructuring through ecological farming, livelihood diversification, climate-smart agriculture, digital transformation, value-chain development, and sustainable natural resource management with the ultimate goal of improving farmers' livelihoods while enhancing environmental sustainability and climate resilience (Government of Vietnam, 2017).

After nearly a decade of implementation, Resolution 120 has created new opportunities for agricultural transformation throughout the Mekong Delta. Nevertheless, the implementation of these policy directions has progressed unevenly across regions and among farming households. Considerable differences remain in farmers' capacity to access resources, adopt new production systems, participate in agricultural value chains, and benefit from emerging development opportunities. Consequently, an important question arises as to whether the transformation promoted by Resolution 120 has achieved its intended objectives of creating a more sustainable, resilient, and inclusive agricultural sector.

The challenges associated with the implementation of Resolution 120 are reflected across social, economic, and environmental dimensions. Although the policy provides a comprehensive framework for sustainable agricultural development, significant constraints remain at the household level, where agricultural transformation ultimately occurs. These challenges are discussed in the following sections.

Table 1.2. Major challenges driving agricultural transformation in the Vietnamese Mekong Delta

Dimension	Major challenges	Implications for agricultural transformation	Transformation response	Key references
Social	Ageing farming population and youth out-migration	Labour shortages, reduced innovation capacity, declining succession in farming	Mechanization, digital agriculture, labour-saving technologies	World Bank (2024); FAO (2024); OECD (2025)
	Limited technical, managerial and digital skills	Slow adoption of climate-smart agriculture, precision farming and digital technologies	Capacity building, extension services, digital literacy programs	FAO (2024); OECD (2025); World Bank (2024)
	Increasing food safety, quality standards and product traceability	Farmers face greater compliance costs and certification requirements	Good Agricultural Practices (GAP), certification, digital traceability systems	FAO (2024); OECD (2025)

Dimension	Major challenges	Implications for agricultural transformation	Transformation response	Key references
Economic	Weak farmer organizations and cooperative participation	Limited knowledge exchange, collective bargaining and technology diffusion	Strengthening cooperatives and producer organizations	World Bank (2016); OECD (2025)
	Declining profitability of rice monoculture	Need to diversify production toward higher-value commodities	Crop diversification, integrated farming, value-added production	World Bank (2016); MARD (2022); FAO (2024)
	High investment costs for agricultural transformation	Financial barriers reduce adoption of new technologies and sustainable practices	Green finance, agricultural credit and investment support	FAO (2024); IFAD (2023)
	Small and fragmented landholdings	Limited economies of scale, mechanization and technological innovation	Land consolidation, cooperative production, service-based mechanization	World Bank (2016, 2024); JICA (2013)
	Weak value-chain integration and unstable agricultural markets	Low bargaining power, price volatility and limited market access	Contract farming, value-chain integration, digital marketplaces	OECD (2025); World Bank (2016); ADB (2024)
	Increasing production costs (inputs, labour and energy)	Reduced farm competitiveness and household income	Resource-use efficiency, circular agriculture and precision farming	FAO (2024); World Bank (2024)
	Salinity intrusion, droughts, floods and climate change	Greater production risks, yield instability and livelihood vulnerability	Climate-smart agriculture, adaptive farming systems	IPCC (2023); Mekong River Commission (2023);
Environmental				

Dimension	Major challenges	Implications for agricultural transformation	Transformation response	Key references
				Resolution 120/NQ-CP
	Land subsidence and declining freshwater availability	Reduced long-term agricultural sustainability	Water-saving irrigation, integrated water resources management	MRC (2023); World Bank (2022)
	Soil degradation, declining sediment deposition and nutrient depletion	Lower soil fertility and declining agricultural productivity	Nature-based solutions, soil restoration and regenerative agriculture	Chapman et al. (2016); Tran et al. (2018); FAO (2024)
	Biodiversity loss and ecosystem degradation	Reduced ecosystem services and agricultural resilience	Ecological agriculture and ecosystem-based management	UNEP (2024); FAO (2024)
	Greenhouse gas emissions from intensive rice cultivation	Pressure to reduce emissions and improve resource efficiency	Low-emission rice production (AWD, SRP, circular agriculture)	IPCC (2023); FAO (2024); IRRI (2023)

Table 1.2 summarizes the major social, economic, and environmental challenges driving agricultural transformation in the Vietnamese Mekong Delta. As Vietnam's largest agricultural production region, the Delta plays a strategic role in ensuring national food security, agricultural exports, and the livelihoods of millions of rural households. However, rapid climate change, demographic transition, market integration, and evolving policy priorities are fundamentally reshaping the region's agricultural systems. These interconnected pressures have highlighted the limitations of the traditional production-oriented development model and reinforced the need for a transition toward more resilient, market-oriented, and environmentally sustainable agriculture under the framework of Resolution No. 120/NQ-CP (Government of Vietnam, 2017; World Bank, 2024; FAO, 2024).

From a social perspective, agricultural transformation is constrained by an ageing farming population, the out-migration of rural youth, limited technical and digital competencies, and increasingly stringent requirements for food safety, quality assurance, certification, and product traceability. In addition, weak farmer organizations and unequal access to extension services reduce farmers' ability to acquire new knowledge and adopt innovative production practices. These challenges limit adaptive capacity, slow the diffusion of digital and climate-smart technologies, and widen disparities in transformation opportunities among farming households (FAO, 2024; OECD, 2025; World Bank, 2024).

Economic challenges remain major barriers to agricultural transformation. Declining profitability of rice monoculture, rising production costs, fragmented landholdings, limited investment capital, weak integration into agricultural value chains, and unstable markets continue to constrain farmers' decisions to invest in higher-value production systems. These structural limitations reduce economies of scale, discourage technological innovation, and restrict the competitiveness of smallholder agriculture. Consequently, improving market linkages, promoting value-added production, strengthening farmer organizations, and facilitating access to agricultural finance have become central priorities in Vietnam's agricultural restructuring strategy (World Bank, 2016; MARD, 2022; IFAD, 2023; ADB, 2024).

Environmental challenges have become the strongest drivers of agricultural transformation in the Mekong Delta. Climate change has intensified salinity intrusion, droughts, floods, land subsidence, and extreme weather events, while decades of intensive rice cultivation have contributed to soil degradation, declining sediment deposition, biodiversity loss, environmental pollution, and increasing greenhouse gas emissions. Together, these pressures have reduced ecosystem resilience and increased production risks, making conventional farming systems progressively less sustainable. Consequently, ecological agriculture, nature-based solutions, climate-smart farming, and low-emission production systems have emerged as key directions for agricultural transformation in the region (IPCC, 2023; Mekong River Commission, 2023; UNEP, 2024; FAO, 2024).

Overall, the challenges presented in Table 1.2 demonstrate that agricultural transformation in the Vietnamese Mekong Delta is a multidimensional process involving simultaneous social, economic, and environmental changes. These challenges are closely interconnected and require integrated responses rather than isolated interventions. They also provide the underlying rationale for Resolution No. 120/NQ-CP and establish the context for

examining agricultural transformation pathways and their implications for sustainable rural livelihoods at the household level in An Giang Province (Government of Vietnam, 2017; World Bank, 2024; OECD, 2025).

C. Research questions

This dissertation addresses the following research questions:

1. What is the current status of agricultural transformation after Resolution 120/NQ-CP, and how does it affect the economic, social, and environmental sustainability of rural livelihoods in the Vietnamese Mekong Delta?
2. Which household characteristics and livelihood assets determine farmers' adoption of different agricultural transformation pathways at the household level?
3. What new directions for agricultural transformation can strengthen the sustainability of rural livelihoods in the Vietnamese Mekong Delta?

D. Research objectives

The overall objective of this dissertation is to examine agricultural transformation and its relationship with the sustainability of rural livelihoods after Resolution 120/NQ-CP in the Vietnamese Mekong Delta and to propose new directions for sustainable agricultural transformation.

The specific objectives are:

1. To assess the current status of agricultural transformation after Resolution 120/NQ-CP and its impacts on the economic, social, and environmental sustainability of rural livelihoods.
2. To identify and analyze the household characteristics and livelihood assets that determine farmers' adoption of different agricultural transformation pathways at the household level.
3. To propose new directions for agricultural transformation that strengthen the sustainability of rural livelihoods in the Vietnamese Mekong Delta.

E. Significance of the Research

This dissertation contributes to the theoretical, empirical, and practical understanding of agricultural transformation and the sustainability of rural livelihoods in the Vietnamese Mekong Delta. By examining agricultural transformation at the household level in An Giang Province after the implementation of Resolution 120/NQ-CP, the study provides a multidimensional assessment of transformation pathways, their livelihood impacts, their determinants, and the future directions required to support sustainable agricultural development.

Theoretical Significance

The dissertation contributes to the literature on agricultural transformation by conceptualizing the process as multidimensional, pathway-based, and household-specific rather than as a uniform or linear transition. Agricultural transformation is examined through five interrelated pathways: land-use transformation, ecological and nature-based agriculture, livelihood diversification, digital transformation, and value-chain integration. This perspective broadens conventional interpretations of agricultural transformation, which often emphasize changes in agricultural productivity, technology, or sectoral structure without fully considering the diversity of household responses.

The study also develops an integrated analytical perspective by linking Agricultural Transformation Theory with the Sustainable Livelihoods Framework and relevant perspectives on sustainability transitions and adaptation. This integration provides a basis for explaining how household characteristics, livelihood assets, institutional conditions, environmental pressures, and policy interventions influence farmers' adoption of different agricultural transformation pathways.

In addition, the dissertation advances the theoretical understanding of the relationship between agricultural transformation and rural livelihood sustainability. By connecting transformation pathways with economic, social, and environmental livelihood outcomes, the study demonstrates that agricultural transformation should not be assessed solely in terms of production or income growth. Its contribution to livelihood sustainability also depends on whether it strengthens household resilience, improves knowledge and social participation, reduces environmental pressures, and enhances the capacity of rural households to respond to climate, market, and institutional change.

Empirical Significance

Empirically, the dissertation provides updated household-level evidence on the current status and impacts of agricultural transformation in An Giang Province after Resolution 120/NQ-CP. It documents the extent to which rural households have adopted different transformation pathways and examines how these pathways vary across three ecological and agricultural sub-regions.

The study provides evidence on land-use changes, ecological and nature-based practices, livelihood diversification, digital technology use, and participation in agricultural value chains. It also assesses farmers' perceptions of the economic, social, and environmental impacts of these transformation processes on the sustainability of rural livelihoods.

Furthermore, the dissertation identifies the household characteristics and livelihood assets associated with farmers' adoption of different agricultural transformation pathways. The findings show that transformation pathways are influenced by different combinations of productive resources, land, financial access, digital assets, organizational participation, and household conditions. This pathway-specific evidence contributes to a more detailed understanding of why some households are able to engage in particular forms of transformation while others face significant resource and institutional constraints.

The integration of household survey data with evidence from Focus Group Discussions and Key Informant Interviews also provides a more comprehensive interpretation of agricultural transformation. This mixed-methods evidence captures not only measurable transformation outcomes but also farmers' experiences, institutional perspectives, implementation constraints, and differences among ecological sub-regions.

Practical and Policy Significance

The dissertation provides practical and policy-relevant evidence for promoting sustainable agricultural transformation in the Vietnamese Mekong Delta. Its findings indicate that a uniform agricultural development strategy is unlikely to respond effectively to the diverse ecological conditions, livelihood assets, farming systems, and adaptive capacities of rural households. Agricultural transformation policies should therefore adopt differentiated, pathway-based, and location-specific approaches.

For land-use transformation, the findings highlight the importance of appropriate infrastructure, water management, land-use planning, and productive assets. For ecological and nature-based agriculture, greater attention is required to technical knowledge, transitional

financial support, certification, and stable markets. Livelihood diversification requires opportunities that are suited to local land conditions, labor availability, and existing farming systems. Digital transformation depends on improvements in digital skills, access to appropriate technologies, and the capacity of smallholders to use digital information in production and marketing. Value-chain integration requires better access to credit, stronger cooperatives, more reliable enterprise linkages, and improved market coordination.

The study also emphasizes the need to strengthen agricultural extension services, farmer organizations, institutional coordination, digital literacy, climate-resilient production, and inclusive market participation. These measures are important for reducing unequal access to transformation opportunities and ensuring that smallholder farmers are not excluded from technological, ecological, and market-oriented changes.

Finally, the proposed directions provide a practical reference for policymakers, local governments, agricultural agencies, development organizations, cooperatives, and other stakeholders involved in agricultural and rural development. Although the empirical analysis focuses on An Giang Province, the analytical approach and policy implications may also be relevant to other areas of the Vietnamese Mekong Delta and comparable climate-vulnerable agricultural regions undergoing ecological, technological, and socioeconomic transformation.

F. Structure of the Dissertation

The dissertation is organized into seven chapters, progressing from the research background and theoretical foundations to empirical analysis, discussion, and policy recommendations. Together, these chapters provide a comprehensive assessment of agricultural transformation and its implications for the sustainability of rural livelihoods following the implementation of Resolution 120/2017/NQ-CP in the Vietnamese Mekong Delta.

Chapter 1: Introduction

This chapter presents the research background and rationale in the context of agricultural transformation, climate change adaptation, and the implementation of Resolution 120/2017/NQ-CP in the Vietnamese Mekong Delta. It defines the research problem, objectives, research questions, scope, significance, and dissertation structure. The chapter establishes the overall direction of the study by emphasizing the need to understand agricultural transformation as a multidimensional process that contributes to sustainable rural livelihoods at the household level.

Chapter 2: Literature Review

This chapter reviews the theoretical and empirical literature on agricultural transformation, sustainable rural livelihoods, climate adaptation, digital agriculture, and agricultural policy. It discusses the evolution of agricultural transformation concepts and identifies major transformation pathways reported in previous studies. The chapter also examines relevant theoretical perspectives, including Agricultural Transformation Theory, the Sustainable Livelihoods Framework, Sustainability Transition Theory, Adaptation Pathways, and the Moral Economy perspective. Based on the identified research gaps, an integrated conceptual framework and research hypotheses are developed to guide the empirical analysis.

Chapter 3: Research Methodology

This chapter describes the research design, study area, sampling strategy, data collection procedures, and analytical methods employed in the study. A mixed-methods approach combining household surveys, key informant interviews, and focus group discussions is adopted to provide both quantitative evidence and qualitative insights. The chapter also presents the measurement of variables and explains the analytical techniques, including descriptive statistics, the Multivariate Probit (MVP) model, Poisson regression, thematic analysis, and triangulation.

Chapter 4: Current Status and Impacts of Agricultural Transformation on Rural Livelihood Sustainability

This chapter examines the current status of agricultural transformation among farm households after the implementation of Resolution 120/2017/NQ-CP. It identifies the prevalence and distribution of five agricultural transformation pathways: land-use transformation, ecological and nature-based transformation, diversification, digital transformation, and value-chain integration. The chapter further assesses the perceived economic, social, and environmental contributions of these pathways to rural livelihood sustainability by integrating evidence from household surveys, focus group discussions, and key informant interviews.

Chapter 5: Determinants of Agricultural Transformation Pathways

This chapter analyzes the factors influencing household participation in agricultural transformation pathways. The determinants of adopting the five transformation pathways are examined using the Multivariate Probit (MVP) model to capture the interdependence among household decisions. The findings identify how household characteristics, livelihood assets,

institutional support, financial resources, and digital capabilities shape different transformation pathways and reveal the complementarities and trade-offs among them.

Chapter 6: Discussion and Future Directions for Agricultural Transformation

This chapter discusses the empirical findings in relation to the theoretical framework and previous studies. It synthesizes evidence from the quantitative and qualitative analyses to explain how different agricultural transformation pathways contribute to sustainable rural livelihoods. Building on these findings, the chapter proposes future directions for agricultural transformation in the Vietnamese Mekong Delta under Resolution 120, emphasizing integrated policy measures that strengthen ecological sustainability, livelihood diversification, digital innovation, market integration, and climate resilience.

Chapter 7: Conclusions and Recommendations

The final chapter summarizes the major findings of the dissertation in relation to the research objectives and research questions. It highlights the theoretical and practical contributions of the study to the literature on agricultural transformation and rural livelihood sustainability. The chapter concludes with policy recommendations for governments, extension agencies, cooperatives, and other stakeholders, discusses the limitations of the study, and suggests directions for future research on agricultural transformation and sustainable rural development.

