

Exploring Strategic Leadership and Multisector Engagement in Malaysian Agrofood Industry Transformation

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ABSTRACT: Malaysia possesses extensive agrofood policies, specialised institutions, research capability and development programmes, yet transformation outcomes remain uneven across commodities and value chains. This study examines how strategic leadership and multisector engagement can strengthen Malaysian agrofood industry transformation. A qualitatively driven practitioner inquiry used two linked layers. Thirty-three expert practitioners provided broad diagnostic evidence, while 14 continuing participants supplied deeper explanatory evidence. Structured items were analysed descriptively, and open-ended responses were interpreted through reflexive thematic analysis and cross-layer comparison. The findings identify strategic leadership as ecosystem orchestration and distinguish realised multisector engagement from nominal consultation. Four interdependent conversion gaps emerged in leadership and coordination, research-to-commercialisation, value-chain and market integration, and investment, technology and producer readiness. The findings were integrated into five applied functions covering strategic stewardship, multisector delivery, innovation-to-market conversion, value-chain and investment readiness, and implementation, monitoring and adaptive learning. The study contributes a practitioner-grounded system-conversion architecture for connecting distributed capabilities to coordinated outcomes.

KEYWORDS - agrofood industry transformation, implementation capability, Malaysia, realised multisector engagement, strategic leadership

I. INTRODUCTION AND BACKGROUND OF THE STUDY

Malaysia's agrofood industry is simultaneously a food-security system, a commercial sector and a national development platform. It includes crops, livestock, fisheries and aquaculture together with the research, finance, processing, logistics, market and institutional functions required to convert production into reliable food availability and economic value. The National Agrofood Policy 2021-2030 places modernisation, research and development commercialisation, market development, talent, sustainability and governance within the same transformation agenda [1]. Recent official indicators show a substantial commercial base, but they also reinforce the need to read productivity and food-security performance at commodity and value-chain level rather than through a single aggregate measure [2].

Malaysia therefore does not begin from an absence of capability. Long-term agricultural development has created specialised institutions, public investment, research capacity, infrastructure and private-sector participation [3]. At the same time, national food-security commentary continues to identify uneven domestic supply, import exposure and commodity-specific self-sufficiency weaknesses [4]. Recent ASEAN competitiveness evidence likewise suggests that performance must be examined through productivity, trade, innovation and market conditions rather than by policy activity alone [5].

The management problem examined in this study is the uneven conversion of those dispersed capabilities into coordinated, commercially workable and sustained outcomes. The central proposition is not that Malaysian agrofood institutions are uniformly ineffective. Rather, the interfaces among policy, research, finance, production, technology, infrastructure and markets can remain weak even when the individual components exist.

Transformation is consequently treated as a system-conversion challenge. It concerns the ability to move from strategic intent and distributed capability to implementation, adoption, commercialisation, resilience and measurable outcomes.

The study examines how strategic leadership and realised multisector engagement influence system conversion and what management architecture can strengthen Malaysian agrofood transformation. Transformation is treated as an interdependent management problem spanning strategic direction, institutional coordination, commercialisation, value-chain readiness and adaptive implementation, while recognising that commodity-specific conditions require differentiated application.

II. PROBLEM STATEMENT AND RESEARCH GAP

The persistent problem is a gap between capability possession and capability conversion. Malaysia has policies, organisations, research programmes, financing instruments and development initiatives, but production, commercialisation, market integration and implementation outcomes remain uneven. The literature explains many individual pieces of this problem, yet the management challenge cuts across several levels. Strategic leadership is often theorised at organisational level, collaboration at network level, Agricultural Innovation Systems at sector level, and value-chain analysis at linked economic-activity level.

Strategic Leadership Theory explains how leaders establish direction, commit resources and mobilise capability for consequential change [6]. Upper-echelons theory shows how experience and cognitive frames influence strategic choice [7], while contemporary strategic-leadership scholarship stresses functions, mechanisms, context and outcomes rather than title alone [8]. These perspectives are important but cannot independently explain how autonomous agencies, firms, financiers, researchers and producer organisations jointly deliver a national-sector transformation.

Collaborative governance addresses this cross-boundary problem by explaining conditions for joint action among autonomous organisations [9], and an integrative governance perspective emphasises principled engagement, shared motivation and capacity for joint action [10]. Integrative leadership further shows that cross-sector collaboration requires leadership that connects rather than simply commands participating actors [11]. Yet participation can remain nominal if it does not alter decisions, resources, responsibility or delivery.

Agricultural Innovation Systems (AIS) provide the sector-specific systems lens. The AIS tradition shifts attention from research organisations alone towards the relationships among knowledge producers, users, firms, extension, finance, regulation and markets [12]. Mission-oriented AIS adds directionality by asking how innovation systems can be organised around explicit food-system challenges [13]. Value-chain governance then tests whether productive and innovative capability reaches aggregation, processing, logistics, standards, buyers and value capture [14]. Dynamic capabilities and strategic learning explain adaptation and reconfiguration when conditions change [15], [16].

The cumulative research gap is therefore not the absence of theory on leadership, collaboration, innovation or value chains. It is the limited integration of these perspectives around the practical question of how distributed capabilities are converted into coordinated outcomes in the Malaysian agrofood setting. The study addresses that gap by defining realised multisector engagement, identifying empirically grounded conversion gaps, and treating implementation capability as the cross-cutting mechanism connecting strategic direction to sustained delivery.

III. RESEARCH QUESTIONS AND OBJECTIVES

The study was organised through four linked research questions and matching objectives. The sequence moved from leadership, to engagement, to the diagnosis of transformation gaps, and finally to the development of an applied framework. Table 1 summarises this one-to-one alignment.

Table 1. Research Questions, Objectives and Inquiry Focus

Research question	Corresponding objective	Inquiry focus
RQ1: How does strategic leadership influence agrofood transformation in Malaysia?	RO1: Examine strategic leadership influence.	Direction, strategic translation, mobilisation, adaptation and implementation discipline.
RQ2: How does multisector engagement contribute to coordination and implementation?	RO2: Analyse the contribution of multisector engagement.	Actor alignment, complementary capability, commitment, joint delivery and producer/user inclusion.

Research question	Corresponding objective	Inquiry focus
RQ3: What major gaps constrain Malaysian agrofood industry transformation?	RO3: Identify major practitioner-grounded transformation gaps.	Leadership/coordination, commercialisation, value chain, investment, technology, producer readiness and implementation.
RQ4: What practical framework can strengthen transformation?	RO4: Develop a practical integrated framework.	Evidence-grounded functions, sequencing, accountability, monitoring and adaptive learning.

Note. Research questions and objectives are aligned one-to-one. The inquiry focus indicates the principal analytical emphasis for each question.

IV. LITERATURE REVIEW AND THEORETICAL FOUNDATION

4.1 Strategic Leadership as Ecosystem Orchestration

The literature supports a functional rather than positional reading of strategic leadership. Direction setting, strategic translation, resource mobilisation, learning, adaptation and accountability are more relevant to system transformation than formal seniority alone. In an agrofood ecosystem, strategic influence is distributed across institutions. Ministries may hold policy and budget authority, research institutions hold knowledge, firms hold operating and market capability, financiers determine investment conditions, and producer organisations influence adoption. Strategic leadership is therefore interpreted as orchestration across interdependent actors rather than unilateral control.

This extension remains bounded. Leadership cannot eliminate climate risk, commodity-price volatility, biological constraints, infrastructure deficits or unfavourable market structure. Its contribution lies in the way such constraints are prioritised, interpreted and managed, and in whether decision chains remain connected across organisational boundaries.

4.2 Realised Multisector Engagement

The study distinguishes broad multisector engagement from realised multisector engagement. The former includes consultation, information exchange and stakeholder participation. The latter is evidenced when interaction changes the operating system. Actors jointly define problems, negotiate roles, commit resources, alter decisions, share information for delivery, accept accountability or continue learning together. This distinction addresses a recurring limitation in collaboration discourse because actor presence does not by itself demonstrate joint implementation.

Realised engagement also requires attention to power. Public agencies, financiers, firms, researchers and producers do not participate with equal authority, information or risk-bearing capacity. Meaningful engagement therefore depends on transparent selection, representation, negotiated safeguards, clear decision rights and the ability of affected actors to influence design and review rather than merely attend meetings.

4.3 AIS, Value Chains and Implementation Capability

AIS identifies the actors and institutions through which agricultural knowledge is generated, exchanged, adapted and used, while value-chain perspectives reveal whether that capability reaches commercial application and market value. The study adds implementation capability as a bridging construct. It refers to the collective ability to identify dependencies, sequence complementary actions, resolve bottlenecks, sustain commitment, monitor outcomes and adapt when evidence changes. Implementation capability is not a substitute for leadership, finance, technology or market readiness. It is the mechanism through which those resources are connected over time.

V. CONCEPTUAL AND ANALYTICAL FRAMEWORK

The analytical framework keeps the principal concepts distinct. Strategic leadership establishes and sustains direction. Realised multisector engagement aligns autonomous actors around critical dependencies. AIS locates the relevant knowledge, production, finance and market relationships. Value-chain and readiness perspectives test conversion into use and commercial outcomes, while implementation capability links agreement to sequenced delivery. The framework did not predetermine the empirical themes. Instead, it sensitised the inquiry to direction, interaction, learning, power, conversion and implementation while allowing rival explanations to remain visible.

VI. METHODOLOGY

The study adopted a qualitatively driven practitioner inquiry from a pragmatic-interpretivist position. Malaysia's agrofood system was treated as a bounded national-sector setting rather than as a single organisational case. The design followed the system-conversion problem identified in the strategic and theoretical analysis. The issue was not simply whether relevant actors existed, but how their decisions and capabilities connected in actual implementation.

Data generation proceeded through two linked layers. Layer 1 involved 33 expert practitioners and provided broad diagnostic evidence. Layer 2 involved 14 continuing participants drawn from Layer 1 and examined mechanisms, constraints and implementation conditions in greater depth. The participant base was weighted toward experienced institutional, research, advisory, managerial, development and industry actors, with more limited representation of frontline producers, consumers, younger enterprises and specialist financiers. The resulting evidence is therefore analytically informative but not statistically representative of the entire Malaysian agrofood population.

Participants were recruited purposively across public, research, industry, finance, producer and advisory domains. Layer 1 was administered first, with participants asked to return the broad diagnostic instrument by 5 June 2026. Continuing participants who voluntarily agreed to follow-up were invited to complete Layer 2 by 10 June 2026. Responses could be returned through direct electronic messages, Microsoft Word documents, electronic forms or email, with voice notes and brief clarifications permitted where appropriate. All return formats used the same question sequence and respondent-code linkage, and the controlled data-summary milestone was completed on 16 June 2026.

Structured items and open-ended materials were analysed separately before integration. Structured responses were summarised descriptively to show concentration, contrast and priority within the purposive sample. They were not used to generate qualitative themes. Open-ended responses carried the principal explanatory weight and were interpreted using reflexive thematic analysis [17]. The analysis involved repeated familiarisation, coding, recursive theme development, comparison across layers, retention of divergent and minority evidence, and explicit claim-boundary controls.

Sample adequacy was assessed through information power and analytical sufficiency rather than a numerical formula. Participants were selected for direct relevance, experience depth, system perspective and perspective diversity. Layer 2 was a sequential continuation rather than an independent validation sample. Claims were therefore based on the relevance and richness of the evidence and on whether all four research questions could be answered with defensible convergence, extension and qualification [18], [19].

The researcher's practitioner background facilitated access to senior and specialised respondents but also created risks of deference, familiarity and interpretive overreach. Recruitment relationships were separated from evidential weight, structured and open-ended evidence were kept analytically distinct, respondent codes were preserved, and positive, negative and qualifying evidence was retained. These safeguards supported a practitioner-grounded interpretation without treating professional familiarity as proof.

VII. RESPONDENT PROFILE AND DATA ADEQUACY

Layer 1 consisted of 33 practitioners. It included 10 consultants or advisers (30%), eight researchers (24%), seven agro-industry participants (21%), five development-agency participants (15%), and one participant each from government, finance and producer/NGO standpoints. Layer 2 continued with 14 participants willing to provide deeper follow-up evidence. The design sought cross-domain insight rather than demographic representativeness because the unit of analytical interest was system-level experience of leadership, coordination, commercialisation and implementation.

Record reconciliation confirmed the realised evidence base described above. Protocol deviations and non-responses were handled transparently in the valid-response bases. Similarity across the two layers was treated as sequential coherence rather than independent replication, and minority and positive evidence was retained to avoid a narrative of universal failure.

VIII. FINDINGS

8.1 RQ1 Strategic Leadership

The RQ1 analysis produced four connected leadership themes. The first concerned shared direction and national purpose. The second concerned strategic translation and execution discipline. The third emphasised transformational, adaptive and innovation-oriented leadership, while the fourth concerned integrity, continuity and credible commitment. Every valid Layer 1 response (33 of 33) placed strategic leadership within the important range. The qualitative evidence, however, showed that leadership mattered not because of title, but because of the work required to translate strategic purpose into action across organisational boundaries.

One participant captured the requirement succinctly, stating, “Strong and strategic vision” (R03, Layer 2 Q14).

The integrated interpretation is strategic leadership as orchestration with accountability. Leaders must establish a common outcome, connect priorities to workstreams and resources, sustain commitment across policy cycles, and remain open to distributed technical and market knowledge. This avoids two extremes. One is centralised command that suppresses specialised expertise, while the other is fragmented participation in which no actor protects the overall transformation mission.

8.2 RQ2 Realised Multisector Engagement

RQ2 identified four engagement themes covering shared priority and actor alignment, public-private-research-finance linkage, commitment, trust and joint delivery, and engagement with producers and technology recipients. Coordination was strongly valued. Among Layer 1 participants, 31 of 33 rated coordination very important and the remaining two rated it important. In Layer 2, 12 of 14 rated collaboration extremely important and two rated it very important. These distributions established salience, while the open-ended evidence explained the mechanism.

A participant emphasised early market linkage, stating, “Industry involvement at the start of Project” (R06, Layer 1 Q8).

The finding is that engagement contributes when it links complementary dependencies around a shared outcome. Government, research organisations, firms, financiers, logistics providers, market actors and producers do not need to participate in every decision. They do need to be connected at the interfaces where their authority or capability is required. The study therefore defines realised engagement by its consequences. These include changed decisions, explicit roles, committed resources, coordinated work, shared learning and continuing accountability.

8.3 RQ3 Four Interdependent Conversion Gaps

RQ3 produced four empirically realised gaps. They concerned leadership and coordination, research-to-commercialisation conversion, value-chain and market integration, and investment, technology and producer readiness. A cross-cutting condition, implementation capability reinforced by policy continuity, influenced all four. The gaps are not statistically ranked independent variables. They are interacting configurations whose effects depend on unresolved dependencies at system interfaces.

The research-to-commercialisation concern was illustrated by “Development of applied agro technologies to increase quantity and quality” (R23, Layer 1 Q8).

The value-chain concern was captured by “Reduce gap between farm harvest and consumer by eliminating middlemen as much as possible” (R31, Layer 1 Q8).

Table 2. Consolidated Empirical Diagnosis from RQ1-RQ3

Domain	Structured orientation	Qualitative meaning	Integrated conclusion
Strategic leadership	33/33 Layer 1 responses placed leadership in the important range.	Shared direction, translation, adaptive leadership, integrity and continuity.	Leadership operates as ecosystem orchestration and credible commitment.
Multisector engagement	Coordination was rated important or very important by all Layer 1 participants. Layer 2 collaboration was rated extremely or very important by all participants.	Shared priority, complementary capability, commitment, producer/user inclusion and joint delivery.	Engagement becomes realised when participation changes roles, resources, decisions or delivery.
Leadership and coordination gap	Coordination was highly valued, while current linkages were more mixed and coordination remained a leading challenge.	Common priority, political will, policy consistency, role alignment and follow-through.	Coordination is valued but not fully operationalised.

Domain	Structured orientation	Qualitative meaning	Integrated conclusion
Research-to-commercialisation gap	Layer 1 translation was limited in 56% of responses. Layer 2 research-industry linkage represented 40% of selections.	Early industry involvement, validation, finance, market access and cost-effectiveness.	Knowledge and technology are not consistently converted into scalable application.
Value-chain and market gap	Market access/distribution represented 37% of Layer 1 value-chain selections.	End-to-end chain, post-harvest, logistics, buyers, exports and value addition.	Production programmes require connected downstream and market functions.
Investment, technology and producer readiness	Digital readiness was limited in 58% of Layer 1 and 50% of Layer 2 responses, while finance remained prominent.	Bankability, farmer return, skills, affordable technology, extension and proven economics.	Adoption depends on joint readiness across finance, technology, organisations and producers.
Implementation capability	Slow progress was identified in 57% of responses, while the combined-domain diagnosis accounted for 50%.	Execution, follow-through, policy continuity, monitoring, adaptation and coordinating authority.	The overarching weakness is conversion from intention to sustained outcome.

Note. Percentages are descriptive signals within the realised purposive sample. They are not national prevalence estimates.

The relational nature of these gaps is central. Financing becomes more difficult when projects lack market validation, reliable supply or clear ownership. Technology readiness weakens when service support, skills or producer confidence are absent. Coordination delays can interrupt approvals and infrastructure commitments, while fragmented value chains reduce incentives for adoption and investment. The most important empirical finding is therefore located at the interfaces. Policy, research, finance, producers, technology providers and markets often possess capability but do not consistently connect.

8.4 RQ4 Five Functional Requirements

RQ4 synthesised the stabilised RQ1-RQ3 themes and empirical gaps into five functional requirements. These covered strategic direction and stewardship, multisector delivery architecture, innovation-to-market conversion, value-chain and investment readiness, and implementation, monitoring and adaptive learning. The requirements were integrated with relevant theory to form the applied management framework. Participants linked the framework to continuity through “A clear and consistent national agro-industry transformation policy with long-term political commitment” (R12, Layer 2 Q14). The same logic appears in the call for “Smart partnership among key stakeholders” (R05, Layer 2 Q14).

8.5 Cross-Layer Convergence, Extension and Divergence

Cross-layer synthesis identified six recurring areas of explanatory coherence. These were strategic leadership, realised multisector engagement, research-to-commercialisation conversion, value-chain and market integration, digital readiness, and financing/implementation capability. Layer 1 showed where practitioner concern concentrated across the broader sample. Layer 2 clarified the mechanisms and conditions contained within those categories. Both layers connected transformation to markets and value chains rather than to production alone, recognised the potential of digital agriculture while qualifying it through readiness constraints, and repeatedly returned to finance and implementation as enabling conditions.

Layer 2 extended rather than merely repeated Layer 1. It extended coordination into smart partnership, institutional collaboration, shared national priorities and a recognisable locus of implementation responsibility. It extended commercialisation through market access, finance, specialised infrastructure and early industry involvement. It also made digital readiness more concrete through AI, mechanisation, precision systems, capability development and financially viable use cases. Future priorities within the follow-up group included food security, innovation capability, climate adaptation, digital transformation and sustainability/ESG. These were treated as contextual signals rather than national rankings.

Divergent evidence was equally important. More positive assessments of transformation and institutional linkage prevented the analysis from claiming universal failure. The defensible interpretation is one of uneven and generally slow transformation, with functioning relationships and pockets of progress coexisting with persistent conversion weaknesses. Participants also differed on what they regarded as the single most important success factor - some emphasised automation or technology, others leadership, political commitment, economic viability, finance, market access, smallholder support or global competitiveness. This diversity strengthens rather than weakens the system-conversion interpretation because different professional standpoints expose different binding constraints within the same interdependent system.

IX. DISCUSSION

The findings extend strategic leadership from an organisation-centred concept towards ecosystem orchestration. The study does not claim that a single leader controls Malaysian agrofood transformation. Instead, leadership is exercised through mission definition, prioritisation, convening authority, strategic translation, resource commitment and the management of unresolved dependencies. This interpretation retains the strategic-leadership emphasis on direction and capability while adapting it to a system in which authority is distributed across institutions.

Realised multisector engagement complements rather than substitutes for leadership. Collaboration generates information, legitimacy, complementary capability and shared learning, but it can also produce delay, symbolic participation or dispersed accountability. Leadership without engagement risks technically or commercially unsuitable decisions. Engagement without leadership risks unclear priorities and weak follow-through. Their combined value lies in connecting authority with capability distributed across the system.

The four gaps deepen the AIS and value-chain interpretation. AIS literature explains why research, extension, finance, firms, producers and markets must interact, but actor presence alone does not ensure commercialisation. Value-chain literature shows how standards, processing, logistics and market governance shape value capture, but viable chains also depend on policy, research and financing interfaces. The empirical contribution is therefore a conversion logic that explains why isolated strengths can coexist with weak outcomes when complementary conditions are not sequenced and governed together.

Implementation capability is the mechanism through which this relationship becomes observable. It includes identifying dependencies, formalising roles, sequencing complementary actions, negotiating risk, resolving bottlenecks, preserving continuity, monitoring outcomes and revising arrangements when evidence changes. Adaptive learning is part of delivery itself rather than an evaluation appended after completion. This connects dynamic-capability reasoning to inter-organisational adjustment without assuming that system-level capability is owned by one actor.

The framework also carries a political boundary. Mission-oriented transformation necessarily selects priorities, technologies, regions and beneficiaries. Those choices can privilege some actors and redistribute risks. Transparent selection, producer representation, conflict-management procedures and outcome monitoring are therefore necessary safeguards [20]. The framework is consequently an accountable coordination architecture, not a rationale for centralising all decisions.

X. INTEGRATED FIVE-FUNCTION SYSTEM-CONVERSION FRAMEWORK

Fig. 1 integrates the empirical findings with the theoretical interpretation. Strategic leadership and realised multisector engagement operate as enabling conditions across five interdependent transformation functions. A cross-cutting implementation-capability layer connects those functions to transformation outcomes, while the return pathway makes the architecture adaptive rather than linear.

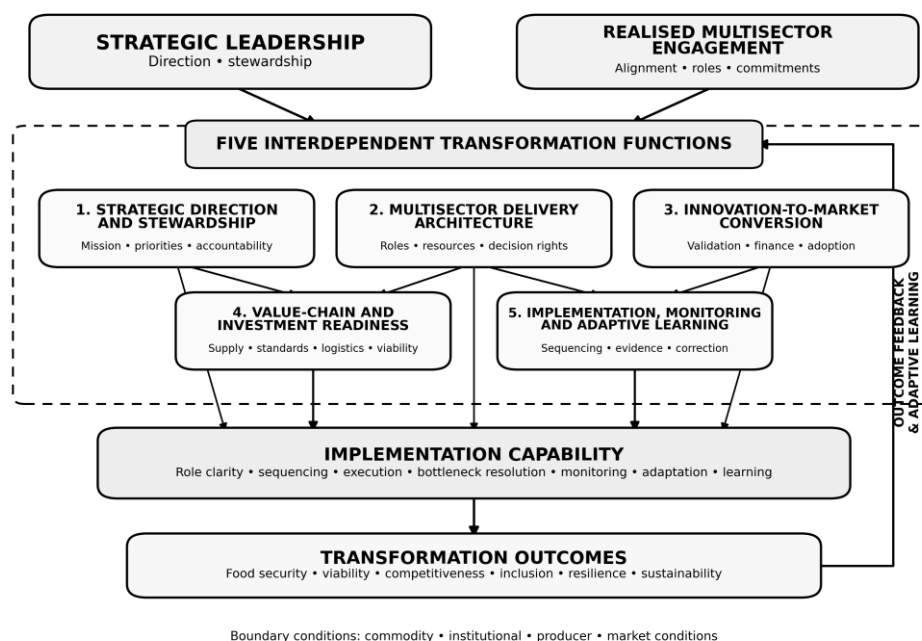


Fig. 1. Integrated Strategic Leadership-Multisector Engagement Framework for Malaysian Agrofood Transformation

Note. Arrows show the conversion pathway through implementation capability and the return of outcome evidence for adaptive review.

10.1 Function 1 Strategic Direction and Stewardship

The first function defines a specific transformation mission, selects priorities and protects strategic continuity. Stewardship is deliberately distinguished from central control. Specialised organisations retain operational authority, while the stewardship function maintains the intended outcome, convenes critical actors and provides a route for resolving cross-boundary obstacles. Mission specificity is important because rice, livestock, fisheries, horticulture and downstream food systems face different biological cycles, market structures, infrastructure needs and public-interest obligations.

10.2 Function 2 Multisector Delivery Architecture

The second function turns stakeholder participation into an operating architecture. It specifies the organisations that control critical dependencies, the decisions each actor can make, the resources they commit, the workstreams they own, the information they share and the route for escalation. Producer and user participation is built into the architecture early enough to influence technology selection, commercial arrangements and adoption conditions.

10.3 Function 3 Innovation-to-Market Conversion

The third function links research and technology to validation, users, intellectual-property arrangements, finance, business models, market demand and scaling. It responds directly to the finding that research capability may exist without commercially workable conversion. Technical success is therefore treated as necessary but insufficient. Technologies must also be affordable, serviceable, adoptable and connected to credible demand.

10.4 Function 4 Value-Chain and Investment Readiness

The fourth function assesses whether production, aggregation, post-harvest handling, processing, logistics, standards, finance, buyers and producer incentives are jointly ready for scale. Bankability is not evaluated separately from supply reliability or producer economics. The function aims to prevent premature investment in infrastructure or technology when complementary value-chain conditions remain unresolved.

10.5 Function 5 Implementation, Monitoring and Adaptive Learning

The fifth function sustains conversion during delivery. Outcome evidence - including adoption, market performance, producer benefit, cost, resilience, environmental effect and institutional delivery - is used to decide

whether implementation should continue, be redesigned, rescaled or stopped. Fig. 2 represents this as a repeating cycle rather than a one-way implementation sequence.

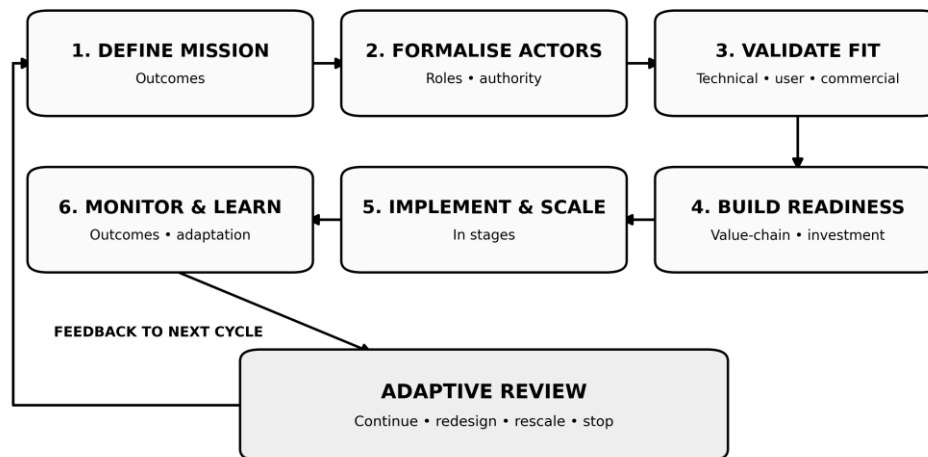


Fig. 2. Sequenced Implementation and Adaptive-Learning Cycle

Note. Outcome evidence feeds back into mission definition, actor configuration, validation, readiness and scale decisions.

XI. CONTRIBUTIONS OF THE STUDY

The theoretical contribution is to place strategic leadership within an ecosystem and to specify orchestration as the mechanism connecting shared direction, complementary actors, credible commitment and dependency resolution. Leadership is not placed above collaboration as unilateral control. It provides purpose, legitimacy and implementation discipline within which collaboration can operate.

The conceptual contribution lies in treating realised multisector engagement as an analytical threshold for judging whether collaboration changes delivery. Combined with implementation capability, this helps identify where cross-sector relationships do, or do not, perform conversion work at critical interfaces and stages.

The empirical contribution is a practitioner-grounded account of Malaysian agrofood transformation that avoids a binary success/failure narrative. Practitioners recognised functioning relationships and areas of progress while repeatedly identifying weak conversion between policy intent, research capability, investment, producer readiness and market outcomes. The resulting four-gap diagnosis is relational rather than a list of isolated constraints.

The methodological contribution lies in the two-layer qualitatively driven design. Layer 1 supplied diagnostic breadth, Layer 2 deepened the explanation, and structured items were deliberately separated from qualitative theme generation. Cross-layer comparison, retention of divergent evidence and explicit claim boundaries enabled the study to use practitioner expertise without presenting purposive-sample percentages as national estimates.

The practical contribution is a five-function conversion architecture that allows policymakers, industry, research institutions, financiers, producer organisations and development practitioners to diagnose where system conversion is breaking down and to organise staged corrective action. It is an adaptable management architecture rather than a universal causal model or national blueprint.

XII. PRACTICAL IMPLEMENTATION ROADMAP

Application should begin with a bounded mission rather than an undifferentiated national programme. The early stage establishes strategic ownership, intended outcomes, actor roles and critical dependencies. The next stage formalises the participating actors and validates technical, producer, market, commercial and financial fit. Readiness is then built before scale, followed by coordinated implementation and outcome monitoring. Evidence at any stage can justify return, redesign or termination.

For policymakers, the framework implies that new programmes should be assessed first for ownership, dependency structure and outcome logic rather than for the number of participating agencies. Coordination should have a defined decision route, and public support should address genuine coordination, capability or market failures without permanently substituting for viable producer and enterprise capability. For research organisations,

commercialisation should begin earlier than technology completion by involving users, industry, finance and market channels during validation. For firms and financiers, investment readiness should include reliable supply, standards, governance, logistics and credible market demand rather than a technology or production case in isolation.

For producer organisations and development agencies, participation should influence design, risk allocation and service arrangements. Adoption is more credible when producers can see the expected return, understand the technology, access skills and maintenance, and connect output to dependable buyers. At state and regional levels, the same five functions can be retained while actor configuration and sequencing are adapted to local land, infrastructure, commodity and institutional conditions. This keeps the framework nationally coherent without forcing uniform operating models.

Table 3. Condensed Implementation Roadmap

Priority	Early action	Evidence of progress	Principal risk
Strategic stewardship	Select a defined mission, assign an accountable steward and specify outcomes.	Mandate clarity, continuity, resolved cross-boundary decisions.	Advisory coordination without decision authority.
Delivery architecture	Map actors, decision rights, resources, workstreams and escalation routes.	Observable commitments, fewer unresolved dependencies, producer/user participation.	Symbolic engagement or dispersed accountability.
Innovation-to-market conversion	Validate technology with users and industry, and integrate finance, the business model and the market pathway.	Adoption evidence, bankable economics, credible market demand.	Technical success without commercial conversion.
Value-chain and investment readiness	Test supply, logistics, processing, standards, buyer, finance and producer-return conditions.	Supply reliability, market access, investment commitment, producer viability.	Scaling before complementary conditions are ready.
Adaptive implementation	Monitor outcomes, authorise corrective action and review continue/redesign/rescale/stop decisions.	Resolved bottlenecks, adoption, producer benefit, market performance and learning.	Activity reporting without outcome-based decisions.

The practical discipline is to measure conversion outcomes rather than activity alone. Meetings, approved grants, research outputs, training numbers and installed technologies are relevant activity measures, but they become evidence of transformation only when linked to adoption, commercial performance, producer outcomes, supply reliability, market access or delivery capability. Monitoring must therefore be connected to decision rights and corrective action.

XIII. LIMITATIONS AND FUTURE RESEARCH

The study is qualitative, practitioner-grounded and bounded to the Malaysian agrofood context. Its participant base provides information-rich cross-domain insight but gives less weight to farmers, frontline officers, consumers, younger agripreneurs and specialist financiers. The purposive evidence base therefore supports analytical rather than population generalisation. Because Layer 2 comprised self-selected continuing participants, it deepens interpretation but does not provide independent corroboration.

The framework is not a tested causal model. Its functions and relationships are evidence-grounded propositions requiring application and evaluation in defined commodities, regions or value chains. Future research should test the architecture through bounded pilots in areas such as rice, ruminant livestock, fisheries, horticulture or technology commercialisation, with explicit outcome indicators and longitudinal evidence. Comparative ASEAN research could also examine which elements are Malaysia-specific and which represent more general system-conversion mechanisms.

XIV. CONCLUSION

This study reframes Malaysian agrofood transformation as a system-conversion challenge. Its central finding is that distributed policy, research, productive and market capabilities generate stronger outcomes when strategic leadership provides direction and realised multisector engagement converts participation into coordinated decisions, resource commitments and delivery.

The empirical diagnosis is organised around four interconnected conversion gaps, with implementation capability and policy continuity operating across them. The five-function framework translates that diagnosis into a recursive management architecture linking stewardship, delivery, conversion, readiness and adaptive implementation.

Its practical value lies in showing where interdependence requires active management rather than assuming that additional policy, technology or finance will automatically produce transformation. Because effectiveness will vary by commodity, institutional authority, producer structure and market conditions, the architecture should be tested and adapted in bounded agrofood missions and value chains rather than applied as a fixed national blueprint.

XV. DECLARATIONS

15.1 Research Ethics and Consent to Participate

Participation was voluntary and informed. Participants received information on the academic purpose of the study, expected participation, confidentiality arrangements and the voluntary nature of comments and follow-up participation. Entry into Layer 2 required separate affirmative consent. Respondent codes were used for analysis and reporting, and personal contact information was maintained separately from the analytical dataset.

15.2 Data Availability

De-identified evidence supporting the findings is retained in the study record. Identifiable participant records are not publicly disclosed in order to preserve confidentiality, and access to any de-identified material remains subject to confidentiality and institutional requirements.

15.3 Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

15.4 Conflict of Interest

The authors declare no conflict of interest.

15.5 Acknowledgements

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