

# Local Supply Chain Integration and Industrial Localization in Saudi Arabia: A Vision 2030 Perspective

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*Abstract- This review examines how local supply chain integration can accelerate industrial localization in Saudi Arabia under Vision 2030. The paper synthesizes peer-reviewed studies and policy documents published between 2020 and 2025 to explain how supplier development, local content governance, digital coordination, human capital formation, and financing mechanisms jointly shape localization outcomes. Unlike narrow discussions that treat localization as a procurement quota, the review argues that sustainable localization depends on multi-tier integration across lead firms, domestic suppliers, logistics actors, regulators, and knowledge institutions. The analysis identifies five recurring themes: demand visibility and long-term procurement commitments, capability building linked to local content policy, digital tools for traceability and planning, workforce development for movement into higher-value manufacturing stages, and cluster-based ecosystems that connect industrial policy, infrastructure, and export readiness. The paper proposes an integrative framework linking policy enablers, operational integration levers, and developmental outcomes such as resilience, value retention, SME participation, innovation, and non-oil growth. It concludes that Saudi Arabia's next localization phase should emphasize supplier depth, interoperability, performance measurement, and innovation-oriented procurement.*

**Keywords:** Local Content, Supply Chain Integration, Industrial Localization, Saudi Arabia, Vision 2030, Supplier Development, Resilience

## I. INTRODUCTION

Saudi Arabia's industrial transformation increasingly depends on whether local firms can be integrated into domestic and regional supply chains in ways that are commercially viable, technologically progressive, and strategically resilient. Recent official planning documents frame industrial development not only as a matter of factory expansion, but also as the creation of connected value chains that deepen local production, reduce import dependence in strategic segments, and expand non-oil competitiveness (Saudi

Vision 2030 Annual Report, 2024; National Industrial Development and Logistics Program [NIDLDP], 2021). In that sense, industrial localization is best understood as the institutional and operational process through which domestic firms capture a greater share of value creation across sourcing, manufacturing, logistics, maintenance, and after-sales activities.

The policy relevance of this issue has sharpened because localization now sits at the intersection of multiple Saudi priorities. Vision 2030 annual reporting places sustained emphasis on local content, supply chain development, advanced manufacturing, renewable energy, and industrial investment attraction as mutually reinforcing agendas rather than isolated policy tracks (Vision 2030 Annual Report, 2025; National Industrial Strategy, 2025). Likewise, sectoral initiatives in energy, mining, logistics, pharmaceuticals, and automotive production increasingly depend on the availability of reliable local suppliers, compliant service providers, skilled technicians, and digital coordination infrastructure. Put differently, the success of localization is shaped not only by how much is produced locally, but by how effectively local actors are integrated into demand planning, standards, financing, scheduling, and technology transfer processes.

This review adopts the position that local supply chain integration is the missing analytical bridge between ambitious localization targets and durable industrial outcomes. Much of the public discourse treats localization as a percentage target in procurement or as a symbolic sign of domestic manufacturing progress. Yet the literature on supply chain integration shows that performance gains emerge when information, materials, decisions, and incentives are aligned across organizational boundaries (Tiwari et al., 2020; Alsadi et al., 2021). The local content literature similarly suggests that

requirements alone do not guarantee learning, productivity, or supplier competitiveness unless complemented by institutional support and capability upgrading (Tsani, 2024; Ramdoo, 2025). These insights are especially relevant to Saudi Arabia, where large projects and anchor firms can generate powerful market pull, but where supplier depth remains uneven across sectors.

Its central message is that value chain localization becomes credible when policy ambition is linked to a granular understanding of manufacturing stages, local material availability, supplier readiness, and operational support ecosystems (AlOtaibi et al., 2020). Although that study focuses on photovoltaics, the broader lesson is transferable: localization is cumulative and stage-specific, and it requires coordination among policy institutions, industrial buyers, technical bodies, and domestic producers.

Against this background, the present paper reviews recent literature and policy evidence on local supply chain integration and industrial localization in Saudi Arabia. Its objectives are fourfold. First, it identifies the main conceptual links between supply chain integration and localization. Second, it evaluates how recent Saudi policy documents and empirical studies frame local content, supplier development, and industrial capability building. Third, it synthesizes the operational levers that appear most relevant for successful localization, including digitalization, standards, logistics, human capital, and cluster formation. Fourth, it proposes an integrative framework that can guide future research and implementation. The review is positioned as a thematic, policy-relevant synthesis aimed at supporting scholarly discussion and practical decision making in the Saudi industrial context.

## II. REVIEW METHODOLOGY

This article is designed as a structured review paper. The methodology combines thematic review logic with targeted policy synthesis in order to capture both scholarly and implementation-oriented evidence. The source base includes peer-reviewed journal articles, official Saudi strategy documents, annual reports, and institutional publications issued between 2020 and 2025. The period was selected because it reflects the

accelerated implementation phase of Vision 2030, the formalization of local content governance, the rollout of sector strategies, and the post-pandemic rethinking of supply chain resilience.

The review followed three filtering principles. First, sources had to contribute directly to at least one of the following dimensions: industrial localization, local content policy, supply chain integration, supplier development, manufacturing digitalization, or sectoral industrial strategy in Saudi Arabia or closely comparable contexts. Third, greater interpretive weight was given to evidence that addressed implementation conditions such as standards compliance, procurement architecture, technology transfer, workforce capability, or cluster development.

The materials were then coded into five themes: policy architecture and local content governance; supplier development and capability upgrading; digital integration and visibility; logistics, infrastructure, and industrial ecosystem readiness; and resilience, sustainability, and long-term competitiveness. A sixth cross-cutting lens examined the role of anchor firms and major projects as demand coordinators. Because the topic mixes academic and policy evidence, the review does not attempt meta-analysis. Instead, it develops a narrative synthesis that is appropriate for a field where concepts are still evolving and where much of the implementation knowledge is embedded in program documents and sector initiatives. This design is suitable for the paper's aim, which is to explain how local supply chain integration functions as a strategic pathway for industrial localization in Saudi Arabia rather than to test a single causal hypothesis.

## III. SAUDI CONTEXT: VISION 2030, LOCAL CONTENT, AND INDUSTRIAL STRATEGY

Saudi policy documents published during 2020–2025 show a clear progression from broad diversification rhetoric toward more systematized industrial localization logic. The NIDLP delivery plan explicitly links local content growth to investment attraction, sector competitiveness, value chain integration, and job creation, while emphasizing the

need to support exporting sectors and connect local supply chains (NIDL, 2021). This framing is important because it treats integration as both an economic and operational goal. Similarly, the National Industrial Strategy identifies the strengthening of supply chains, the development of industrial enablers, and the expansion of advanced manufacturing capabilities as mutually dependent priorities (National Industrial Strategy, 2025).

Recent Vision 2030 reporting adds empirical momentum to this orientation. The 2024 and 2025 annual reports highlight improvements in local supply chain integration, stronger localization initiatives, and higher local content performance in strategic sectors, including oil and gas supply chains (Vision 2030 Annual Report, 2024; Vision 2030 Annual Report, 2025). These signals matter because they indicate that localization is moving from symbolic industrial policy to monitored implementation. The issue, however, is not merely whether the aggregate percentage of local content rises. The deeper question is whether local firms are moving into more knowledge-intensive and coordination-intensive positions within value chains.

Saudi experience across sectors suggests that localization trajectories differ by industrial architecture. In renewable energy and photovoltaics, for example, localization depends on staged movement across modules, inverters, structures, engineering support, and operations and maintenance, with different levels of local feasibility across components (AlOtaibi et al., 2020; Alghamdi et al., 2025). In pharmaceuticals, local manufacturing capacity is shaped by regulation, technology access, and supply security considerations, especially for upstream inputs and specialized formulations (Tawfik et al., 2022). In automotive localization, recent work highlights the importance of Industry 4.0 readiness, localized supplier networks, and ecosystem coordination if assembly activity is to translate into durable industrial upgrading (Aljuaid et al., 2024). These sectoral differences reinforce a key review premise: localization should be treated as value-chain-specific integration work rather than a one-size-fits-all program.

A second contextual factor is the growing role of SMEs and domestic entrepreneurship. Saudi policy increasingly positions SMEs as future contributors to industrial depth, innovation, and flexible supply capacity, but the evidence also shows that SMEs face bottlenecks in digitalization, financing, process sophistication, and market access (Monsha'at, 2022; Monsha'at, 2025a; Monsha'at, 2025b). This means local supply chain integration cannot rely only on top-down mandates. It also requires market access pathways, structured onboarding, working capital support, quality certification, and predictable procurement windows.

Finally, the Saudi case should be viewed within a broader global debate. International literature cautions that crude reshoring or over-localization can raise costs and reduce resilience if it substitutes autarky for strategic diversification (OECD, 2025). The policy challenge is therefore not simple substitution of imports with domestic output. Rather, it is selective localization in segments where domestic capability can be built, linked, and scaled without undermining efficiency or export potential. Saudi Arabia's strategic location, logistics investments, industrial cities, and large anchor demand create favorable conditions for this more balanced model, but implementation quality remains decisive.

#### IV. THEMATIC REVIEW AND ANALYSIS

The first major theme in the literature is that localization succeeds when it is supported by strong policy architecture and credible local content governance. The local content field has evolved from narrow domestic preference rules toward more nuanced approaches that combine procurement expectations, capability formation, and developmental spillovers (Tsani, 2024). In the Saudi context, this shift is reflected in the increasing use of measurable local content frameworks, sectoral strategies, and program-level monitoring. The practical significance of governance lies in reducing uncertainty. Firms invest in local facilities, tooling, certification, and workforce training only when they can anticipate stable demand conditions and reasonably consistent policy signals.

Policy design matters because not all local content measures generate the same outcomes. Studies of local content requirements show that long-term developmental benefits are more likely when requirements are coupled with supplier learning, technology spillovers, and incentives for multinationals to build local partnerships rather than merely rearrange compliance documentation (Ramdoo, 2025). For Saudi Arabia, where many strategic sectors rely on foreign OEMs, EPC contractors, and international technology providers, this finding is highly relevant. Effective localization governance should therefore encourage relational contracting, supplier mentoring, and local engineering participation instead of focusing solely on short-run spend ratios.

Saudi official documents increasingly acknowledge this need for depth. NIDL's emphasis on integration across sectors and value chains suggests that localization performance depends on interdependencies among energy, mining, logistics, and industry rather than isolated sector targets (NIDL, 2021). This is reinforced by Vision 2030 reporting that highlights supply chain localization as a pathway to industrial growth rather than merely a reporting metric (Vision 2030 Annual Report, 2025). Such framing is promising, but it also raises implementation questions about how metrics are defined, how local content is audited across tiers, and how developmental outcomes are distinguished from transactional compliance.

An important implication from the review is that governance must be differentiated by localization maturity. Early-stage industries may require incentives for assembly, supplier mapping, and workforce preparation. Intermediate stages require standards support, local testing facilities, vendor qualification systems, and digital interoperability. Advanced stages depend on R&D linkages, export readiness, design capability, and process innovation. Treating all industries with a uniform local content instrument risks shallow gains and discourages realistic sequencing. A maturity-sensitive governance model is therefore more compatible with sustainable localization.

The second theme concerns supplier development and capability upgrading. Across the literature, local supply chain integration is repeatedly shown to depend on whether domestic suppliers can meet requirements for quality, delivery reliability, traceability, cost discipline, and engineering responsiveness. This is especially important in sectors dominated by large projects or regulated industries, where procurement standards are non-negotiable. Supplier development therefore becomes a strategic bridge between localization ambition and procurement feasibility.

Saudi evidence suggests that large buyers and anchor projects can play a catalytic role in this process. Local content progress in strategic sectors is often associated with the purchasing power of major firms, project developers, and public programs that can create predictable demand while shaping vendor expectations (Vision 2030 Executive Summary, 2025; Vision 2030 Annual Report, 2025). However, demand aggregation alone is insufficient. Domestic suppliers also need structured support in certification, process control, digital documentation, inventory planning, and cost modeling. Without these foundations, procurement teams may continue to rely on imports because local alternatives appear operationally risky.

The SME literature adds a useful dimension here. Saudi SMEs are increasingly encouraged to join growth sectors, yet many remain constrained by access to finance, operational systems, and supply chain optimization capabilities (Monsha'at, 2022; Monsha'at, 2025b). This implies that localization policies should not focus only on headline industrial investors. They must also create supplier-readiness ladders for smaller firms. Such ladders may include pre-qualification support, shared testing facilities, technical extension services, digital procurement portals, and performance-based mentoring programs. The supplier development problem is therefore institutional as much as technical.

Research on firm performance in Saudi Arabia also suggests that supply chain integration mediates the relationship between strategic orientation and outcomes (Alsadi et al., 2021). This finding can be extended to localization: domestic suppliers become

more valuable when they are integrated into forecasting, design changes, quality loops, and improvement programs. Local sourcing is thus not a substitute for coordination; it requires more coordination, at least in the capability-building phase. In practice, this means lead firms should share demand signals, engineering specifications, and improvement feedback with local vendors early enough for learning to occur.

The solar localization literature provides an instructive analogy. AlOtaibi et al. (2020) show that localization feasibility differs across modules, inverters, structures, administrative support, and civil works. The implication is that supplier development should be granular rather than generic. Saudi industrial programs are more likely to succeed when they identify which subcomponents, services, and maintenance tasks can realistically be localized first, and then build supplier programs around those specific nodes.

A third theme is the role of digital integration in enabling localized supply chains. The broader supply chain literature increasingly links digitalization with integration, visibility, and resilience (Tiwari et al., 2020; ADB, 2023; Li et al., 2025). In the Saudi context, digital transformation has also been associated with improved firm performance when mediated by smart technologies and digital supply chain practices (AlMulhim, 2021). For localization, the relevance of digitalization is straightforward: local suppliers can only compete reliably if they are connected to the planning and execution systems of larger buyers.

Digital integration helps in at least four ways. First, it improves visibility across orders, inventories, shipment status, and exceptions. Second, it supports standards compliance through digital records, traceability, and document control. Third, it enables supplier performance monitoring and continuous improvement. Fourth, it reduces coordination costs between geographically distributed actors. These effects are especially important when local supplier bases are new or still building credibility, because digital transparency can lower perceived procurement risk.

Saudi industrial transformation is increasingly embedded in a wider digital agenda. Monsha'at's reports on digital transformation and supply chain optimization indicate that SMEs are being encouraged to adopt digital tools not simply for efficiency but for market participation and long-term competitiveness (Monsha'at, 2024; Monsha'at, 2025b). Meanwhile, recent Saudi-focused studies argue that digital transformation strengthens resilience and sustainability in manufacturing and supply chain settings under Vision 2030 (Alquraish et al., 2025; Alhaderi et al., 2025). These findings support the proposition that industrial localization should be designed as a digital integration challenge as much as a manufacturing challenge.

The caution, however, is that digitalization does not automatically produce localization. It can just as easily make import-intensive supply chains more efficient. The developmental effect depends on whether digital tools are used to qualify, connect, and upgrade domestic suppliers. Therefore, localization-oriented digital policy should emphasize interoperability standards, supplier onboarding platforms, data-sharing protocols, and digital quality infrastructure. In practical terms, Saudi industrial buyers need systems that can connect tier-one and tier-two local suppliers into production planning, procurement, warehousing, and maintenance processes without excessive transaction friction.

This point is particularly salient for higher-value manufacturing. Automotive localization analysis in Saudi Arabia argues that Industry 4.0 technologies can support a sustainable localized production model by improving coordination, precision, and ecosystem learning (Aljuaid et al., 2024). Similar logic applies to pharmaceuticals, renewable energy components, and industrial services. The more complex the value chain, the more central digital integration becomes to local participation.

The fourth theme concerns logistics, infrastructure, and industrial ecosystem readiness. Localization is often framed narrowly as a factory decision, but the literature suggests that the wider ecosystem is decisive. Industrial land, transport links, customs efficiency, warehousing, energy reliability, standards laboratories, and maintenance networks all shape

whether local production and sourcing are economically credible. Saudi strategy documents explicitly connect industrial growth with logistics ambition, reflecting the view that value chains perform better when production and movement systems are jointly planned (NIDL, 2021; National Industrial Strategy, 2025).

Recent logistics scholarship on Saudi Arabia shows a shift toward sustainability, technology adoption, and systems-level thinking aligned with Vision 2030 (Alasmari et al., 2025). This is relevant because localized production requires not just domestic factories, but also dependable domestic and regional flows of components, spares, and finished goods. A localized plant that depends on slow, fragmented, or high-cost inland logistics may not remain competitive. Therefore, local supply chain integration should be understood as a geographically embedded capability supported by industrial cities, ports, digital trade systems, and multimodal transport connectivity. Cluster logic is also important. When suppliers, assemblers, engineering services, research institutions, and training providers are co-located or tightly connected, learning cycles accelerate and transaction costs fall. The PV localization case provides a concrete example: local availability differs markedly across structures, electrical work, modules, and inverters, and future gains are projected to depend on coordinated development of administration, manufacturing, and support capabilities rather than isolated plant investments (AlOtaibi et al., 2020). This cluster-oriented interpretation can be generalized to other Saudi industries.

A related issue is standards and quality infrastructure. Localization depends not merely on physical capacity but on whether firms can prove conformity to technical, safety, and documentation requirements. Shared laboratories, product testing capabilities, calibration services, and certification support therefore become strategic enablers. These functions lower barriers for domestic suppliers and reduce buyer concerns about switching from imports to local sources. They also support exportability, which is essential if localized industries are to achieve scale beyond domestic demand.

The ecosystem perspective also clarifies the difference between shallow and deep localization. Shallow localization may create domestic assembly and basic services while leaving critical design, precision inputs, and advanced maintenance dependent on imports. Deep localization requires a denser ecosystem in which domestic firms participate in engineering, specialized materials, tooling, and process improvement. Saudi Arabia's infrastructure investments and logistics reforms create favorable preconditions, but the review indicates that ecosystem density remains a more meaningful indicator of progress than headline factory counts alone.

The fifth theme links localization with resilience, sustainability, and long-term competitiveness. Global supply shocks since 2020 have intensified interest in localization, but the literature warns against simplistic interpretations. Resilience is not achieved by maximum domestic substitution at any cost; rather, it comes from balanced supply structures, redundancy where needed, digital visibility, and the ability to adapt under disruption (Shishodia et al., 2023; OECD, 2025). For Saudi Arabia, this means localization should be pursued selectively in segments that contribute to security, industrial learning, and economic spillovers while remaining connected to international trade and technology networks.

Saudi-specific studies increasingly connect digital transformation, green supply chain practices, and diversification strategies to resilience and performance under Vision 2030 (Alhaderi et al., 2025; Alkandi et al., 2025; Altuwajri et al., 2025). These studies suggest that localization can support resilience when it improves response speed, reduces exposure to concentrated import dependencies, and enables closer collaboration between buyers and suppliers. Yet resilience also requires supplier professionalism, logistical preparedness, and sustainability compliance. A fragile local supplier base does not improve resilience simply by being domestic.

Sustainability adds another layer. Localization can lower transport exposure and support domestic circularity, but it may also increase costs or emissions

if production is inefficient or if local capability gaps lead to waste, rework, or overstocking. Therefore, localization policy should be paired with efficiency, quality, and green manufacturing objectives. This is particularly relevant in sectors such as energy, construction materials, industrial equipment, and transport manufacturing. The emerging literature on circular economy, sustainable logistics, and green energy transition in Saudi Arabia supports the idea that industrial localization should be evaluated through a broader sustainability lens, not only through domestic spend shares (Islam et al., 2024; Alasmari et al., 2025).

Competitiveness is the final element. Long-term localization cannot depend indefinitely on protection or policy preference. Domestic firms must eventually compete on quality, responsiveness, cost, and innovation. The review therefore points toward a developmental sequence in which policy support helps create demand certainty and capability-building, but competitive pressure and export orientation gradually become more important. In this respect, localization and competitiveness are complements rather than alternatives. Local supply chain integration is precisely what allows domestic suppliers to accumulate the operational discipline needed to compete more broadly.

#### V. DISCUSSION: TOWARD AN INTEGRATIVE LOCALIZATION FRAMEWORK

Taken together, the reviewed evidence supports a central argument: industrial localization in Saudi Arabia is most likely to succeed when it is designed as an integration problem across firms, tiers, institutions, and infrastructures. The literature does not support the view that local content percentages alone are sufficient. Instead, localization is strengthened when procurement policy, supplier upgrading, digital transparency, logistics readiness, and workforce capabilities are aligned around specific value-chain opportunities.

This review therefore proposes an integrative framework with three layers. The first layer consists of policy and ecosystem enablers: sector strategies, local content governance, cluster infrastructure,

standards institutions, and financing support. The second layer contains operational integration levers: demand visibility, supplier qualification, digital interoperability, joint planning, engineering coordination, and performance feedback loops. The third layer comprises developmental outcomes: greater supplier depth, reduced import dependency in targeted segments, stronger SME participation, better resilience, innovation spillovers, and higher non-oil value creation. The logic of the framework is sequential but also recursive. Positive outcomes strengthen the business case for further integration, while integration failures reveal where enablers remain weak.

The framework also implies that anchor firms and major projects have a special developmental responsibility. Because they command procurement volumes and define technical standards, they can shape whether local suppliers remain peripheral or become integrated partners. This role goes beyond buying locally whenever possible. It includes supplier mapping, phased onboarding, early specification sharing, trial orders, structured performance review, and cooperation with industrial agencies and training providers. Where such routines are absent, local suppliers may face an impossible transition from informal capability to world-class compliance.

A second discussion point concerns measurement. Localization dashboards should move beyond aggregate spend ratios to include indicators of supplier depth, local engineering hours, domestic value added, delivery reliability, defect rates, technology transfer outcomes, and progression into higher-value stages. Such measurement would better capture whether industrial capabilities are genuinely deepening. It would also help distinguish between superficial local assembly and more substantive localization involving design, process control, maintenance, and upstream inputs.

A third insight concerns sequencing. Saudi Arabia's industrial sectors differ in capital intensity, technology complexity, and ecosystem maturity. This means the pathway to localization should be tailored. In some sectors, immediate opportunities lie in fabrication, structures, packaging, maintenance, and logistics support. In others, the priority may be

specialized subassemblies, software-enabled services, or co-development partnerships. A staged approach allows policymakers and firms to concentrate resources where learning effects are most achievable. Finally, the review highlights the strategic complementarity between localization and openness. Saudi Arabia's industrial future is unlikely to be built through inward-looking substitution alone. Instead, it will depend on selective localization anchored in global partnerships, export potential, and continuous capability upgrading. The more Saudi firms are integrated into reliable, transparent, and standards-driven supply chains, the more localization can move from policy aspiration to competitive industrial reality.

#### VI. POLICY AND MANAGERIAL IMPLICATIONS

Several practical implications emerge from the review. For policymakers, the main priority is to align local content instruments with supplier capability programs, standards support, and digital infrastructure. For anchor firms, the key task is to convert procurement power into developmental procurement by creating structured pathways for local supplier entry and upgrading. For SMEs, competitiveness will increasingly depend on certification, process discipline, and digital readiness rather than price alone. For researchers, a major agenda lies in measuring domestic value creation at multiple tiers and comparing localization pathways across Saudi sectors.

The review also suggests a set of operational priorities for the next phase of implementation. These include supplier segmentation by capability level, shared industrial services for testing and certification, data-sharing standards for localized supply networks, and financing mechanisms tied to vendor development milestones. Equally important is the integration of vocational, technical, and engineering education with sector-specific localization roadmaps. Without skills alignment, industrial depth will remain limited.

In strategic terms, Saudi Arabia should continue distinguishing between resilience-enhancing localization and inefficient over-localization. The

objective is not to localize every input, but to localize where domestic capability can compound through learning, clustering, and scale. That balanced approach is more consistent with long-term competitiveness and with the Kingdom's ambition to become both an industrial powerhouse and a global logistics hub.

#### VII. CONCLUSION

This review set out to examine how local supply chain integration can support industrial localization in Saudi Arabia under Vision 2030. The evidence from 2020–2025 indicates that localization is most durable when it is treated as a coordinated value-chain strategy rather than a procurement slogan. Policy architecture matters, but so do supplier development, digital visibility, quality infrastructure, logistics capability, and workforce formation. Saudi Arabia has established a strong strategic foundation through Vision 2030, NIDL, and the National Industrial Strategy, and recent sector experience shows real momentum in linking localization to industrial growth.

The review's main contribution is to show that integration is the operational core of localization. Domestic suppliers create more value when they are connected to planning systems, standards regimes, engineering routines, and improvement cycles. Conversely, weak integration can leave localization shallow, fragmented, and vulnerable. The next phase of Saudi industrial policy should therefore emphasize supplier depth, ecosystem density, and innovation-oriented metrics. By doing so, the Kingdom can turn localization from a target into a durable capability that supports resilience, non-oil diversification, and long-run competitiveness.

Its success will depend on disciplined execution, measurable learning, and coordinated upgrading. Execution matters.

Figure 1. Conceptual architecture linking supply chain integration and localization outcomes



Figure 2. Industrial localization maturity path



Table 1. Representative evidence base used in the review

Source	Type	Primary focus	Contribution to this review
AlOtaibi et al. (2020)	Sector review	PV value chain localization in Saudi Arabia	Demonstrates staged localization logic and the importance of capability sequencing.
Alsadi & Aloulou (2021)	Empirical study	Supply chain integration and Saudi firm performance	Shows integration as a performance-enabling organizational capability.
Tawfik et al. (2022)	Sector review	Pharmaceutical manufacturing localization	Highlights governance, R&D, and upstream capability gaps.
ADB	Policy	Digitalization	Clarifies how

(2023)	report	and supply chain resilience	visibility and data-sharing support resilience.
Tsani (2024)	Policy review	Local content policy design	Warns that requirements need capability building and spillover logic.
Aljuaid et al. (2024)	Sector study	Automotive localization and Industry 4.0	Connects localization with digital manufacturing and ecosystem readiness.
Vision 2030 Annual Reports (2024–2025)	Official reporting	Local content and sector implementation	Provides current implementation signals and strategic direction.
Monsha'at reports (2024–2025)	Institutional reports	SME readiness and supply chain optimization	Shows SME bottlenecks in capability, finance, and digitalization.

Table 2. Policy-action matrix for deeper localization

Localization lever	Operational actions	Expected gains	Indicative KPIs
Demand visibility	Long-term offtake signals, supplier mapping, phased procurement windows	Investment confidence and supplier entry	Share of qualified local suppliers; forecast accuracy
Supplier development	Certification support, trial orders, engineering mentoring, shared testing	Higher delivery reliability and lower defect risk	On-time delivery; rejection rate; supplier graduation rate
Digital integration	ERP links, traceability, supplier portals, shared dashboards	Faster coordination and stronger transparency	Data completeness; lead-time variance; digital onboarding

			rate
Ecosystem infrastructure	Cluster services, labs, logistics links, maintenance capability	Lower transaction costs and greater industrial depth	Local lead time; lab utilization; domestic service coverage
Skills and innovation	Technical training, applied R&D, university-industry projects	Movement into higher-value stages	Local engineering hours; training completion; co-development projects

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