

Free Trade Zones as Development Engines: Anzali's Local Manufacturing Gains, Systemic Challenges, and Regional Development Lessons (Iran)

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Abstract

Free Trade-Industrial Zones, with their unique characteristics compared to domestic regions, can serve as effective platforms for economic growth and prosperity at both regional and national levels. However, without sufficient attention to the core objectives of these zones, they may transform into hubs for importing consumer goods rather than fostering exports and production. This change could result in capital fleeing the country and weaken the national economy.

This study assesses the Anzali Free Trade-Industrial Zone's performance regarding investment, exports, and imports in the last two decades. Employing a mixed-methods approach, it analyzes data from library research and structured interviews with Anzali Free Zone administrators to evaluate implemented investments and national export-import statistics, including exports of goods produced within the zone for foreign and domestic markets.

The results demonstrate a notable decline in import volumes through the Anzali Free Zone during the study period, while export levels have remained mostly unchanged. Nevertheless, the zone has experienced substantial growth in exports of locally manufactured goods, including final products for international markets and domestic shipments to mainland Iran - a positive indicator of expanding employment opportunities within the zone. Despite these achievements, several significant challenges persist. Regulatory inconsistencies continue to hinder operations, particularly in enforcing zone-specific policies. Furthermore, the zone has underperformed in developing value-added processing for regional raw materials. It faces critical infrastructure deficits that limit its potential as a key node in the North-South Transport Corridor. Addressing these limitations will require a multifaceted approach centered on attracting targeted investment in processing industries, fostering specialized industrial ecosystems, and pursuing strategic maritime partnerships to enhance trade connectivity. Such interventions could substantially strengthen the zone's capacity to drive export-led growth while maximizing its economic contribution to the broader region.

1 Introduction

The development and revitalization of activities in various regions, based on their inherent potentials and situational advantages, is a common approach in regional spatial planning. The relative positioning of certain geographical areas—particularly their border access points (maritime, terrestrial, and especially transboundary)—enables them to function as catalytic hubs for leveraging potential and existing environmental capacities. The strategy of designating special economic zones (SEZs) and free zones is among the policy tools used to stimulate development and enhance economic activities across regions. Through the spatial planning and operationalization of these zones, their hinterlands can integrate into cycles of production, consumption, export of local products, and import of needed goods. Establishing such zones must naturally align with the host regions' comparative economic advantages, aiming to improve the financial balance and performance of exports and revenues relative to costs and imports. Therefore, to promote economic development, governments designate certain parts of the country as

free zones governed by more lenient regulations than domestic laws to facilitate investment, licensing, and financial activities in these areas. This approach integrates the national economy into the global economy and enables active participation (Bahmani & Simbar, 2012). The ultimate goal of establishing free zones is to reduce production costs, thereby creating favorable conditions for exporting goods abroad, which fosters economic growth and prosperity in the targeted region and the country. However, these functions might become problems instead of advantages without a clear strategy.

The decision to expand the number of industrial and commercial free zones has been placed on the agenda of the government and parliament, garnering both supporters and opponents. (Sahragard et al., 2016). Commercial-industrial free zones, particularly those in border areas, possess distinct and unique advantages for trade and production compared to domestic regions (Kheyroddin & Razpour, 2016). These zones can serve as strategic platforms for fostering economic development and prosperity at both regional and national levels. The Anzali Commercial-Industrial Free Zone is the seventh such zone established in Iran. This Free Zone's export-oriented functions require systematic evaluation to determine whether its trade balance effectively strengthens domestic production and exports or—given the legal and regulatory incentives for goods exchange—has devolved into a hub for importing consumer products. In other words, what is the financial balance between export revenues and import costs? Establishing these zones aims to promote regional development by revitalizing production activities, boosting exports, and generating foreign exchange earnings—while carefully leveraging comparative advantages to import essential goods. Yet, such zones' actual trade balance (exports vs. imports) remains a contentious issue among researchers. To what extent has the goal of strengthening exports and their revenues been achieved relative to the reality of import costs?

This article examines the case of the Anzali Free Trade Zone to provide a nuanced assessment of its successes and shortcomings in export-import balance, offering actionable insights for readjusting policies and development strategies in such zones.

Accordingly, by reforming policies in Iran's free trade zones—particularly in the Anzali Commercial-Industrial Free Zone—we can anticipate a tangible increase in the zone's efficiency for the residents of Bandar Anzali, Gilan Province, and the nation as a whole. However, a critical issue that must not be overlooked in this development is the risk of the Anzali Zone devolving into a gateway for consumer goods imports and subsequent capital flight.

Although recent statistics from the High Council of Free Zones indicate a temporary decline in imports through Anzali in select years, the zone's economic framework still requires strategic revisions. These adjustments should ensure a positive trade balance, where export-oriented production aligns with targeted imports of essential goods and services—fulfilling the original purpose of such zones. Therefore, this article evaluates the Anzali Commercial-Industrial Free Zone across multiple dimensions: its constraints and opportunities, employment rates, investment inflows, and export-import dynamics.

Having outlined these issues, we must now briefly engage with the existing theoretical literature in this field. This will allow us to analyze and reinterpret the overarching policy documents of the Anzali

Commercial-Industrial Free Zone within a framework of established principles and empirical evidence, while systematically assessing its contextual conditions. Subsequently, by evaluating the zone's capacities and constraints, we will examine the export-import balance and functional performance of the Anzali Free Zone. This analysis aims to derive actionable insights for enhancing the zone's role in effectively developing key sectors of Iran's northern regions.

2 Literature review

Some scholars discussed SEZs, which are drivers of integrated urban development. The strategic planning of Special Economic Zones (SEZs) is increasingly recognized as a cornerstone of sustainable urban development. Abdel-Wahab (2024) demonstrates how effective SEZ planning can advance sustainable development goals, stimulate industrial revitalization, and foster urban growth through job creation and clean energy adoption. This aligns with Xia et al. (2024), whose study on China's Free Trade (Pilot) Zones (FTZs) reveals that such zones enhance urban land use efficiency (ULUE), particularly in central and highly urbanized cities. These findings suggest that SEZs like Anzali can catalyze urban productivity by optimizing spatial planning and infrastructure investments. However, as Ghosh et al. (2016) cautioned, the benefits of FTZs—such as spillover effects in non-manufacturing sectors—diminish with distance, emphasizing the need for localized urban integration strategies.

Other scholars mainly focus on port cities and sustainability. Port-based SEZs face unique challenges in balancing economic growth with environmental and social sustainability. Applying synergy theory, Su et al. (2024) developed a port-economy-environment model for island systems. Results demonstrate fluctuating growth in port activity and the local economy alongside environmental protection, with system coordination improving from low to intermediate levels. Obstacle modeling identifies air and water pollution from port operations, as well as insufficient infrastructure, as key constraints. Recommendations include strategic industry reorganization, enhanced port capacity, and pollution mitigation, offering a framework for sustainable island port development. Ogara et al. (2023) highlight this tension in their framework for evaluating port cities in the Western Indian Ocean (WIO) and Global South (GS), noting a persistent bias toward Global North-centric sustainability models. Jiang et al. (2023) focused on China's coastal Pilot Free Trade Zones (PFTZs) in a study that employed spatial econometric analysis on panel data (114 cities, 2008–2019) to assess the impact of seaport capacity on export trade. Results confirm a significant positive direct effect within PFTZ seaport cities and reveal notable spatial spillover effects that benefit neighboring cities. These findings provide valuable insights for policymakers seeking to enhance seaport competitiveness and promote export-led growth in China's coastal PFTZs. Pak and Majd (2011) reinforce this argument through their case study of Iran's Kish Island, advocating for "spatial umbrella plans" to reconcile industrial priorities with coastal sustainability. Similarly, Sahragard et al. (2016) identify policy reforms in banking and investment frameworks as critical for enhancing Anzali's export capacity, while Tamimi and Rahmani (2015) emphasize its untapped potential in sustainable tourism. This sector could diversify economic activities without compromising environmental integrity.

The establishment of SEZs often triggers environmental trade-offs. Zhuo et al. (2021) warn of an environmental "policy trap" where FTZ expansion exacerbates ecological constraints—a concern echoed by Grossman and Krueger (1991), who link free trade to pollution via scale, structural, and technological effects. Liu et al. (2022) further confirm that developing countries, including Iran, risk environmental degradation through trade liberalization. These critiques underscore the urgency of integrating green policies into Anzali's development model. For instance, Kheyroddin and Ghadi (2022) critique the import-oriented focus of Iran's Amirabad Port SEZ and advocate for value-added industries and industrial clusters to reduce ecological strain. Their recommendations could inform Anzali's strategy to prioritize sustainable production over warehousing.

Other articles discuss regional connectivity and its relation to SEZs. These areas often serve as geopolitical tools to strengthen regional and global trade networks. Keshavarzian (2010) illustrates this through Dubai's Jebel Ali and Iran's Kish FTZs, arguing that such zones reflect state-building agendas and active engagement with globalization. Anzali's proximity to Russia and Central Asia positions it as a Eurasian trade gateway, akin to the Amirabad Port SEZ analyzed by Kheyroddin et al. (2021), which bolsters the International North-South Transport Corridor (NSTC). However, Kheyroddin and Ghadi (2022) reveal that underinvestment in export-oriented industries (e.g., construction materials) limits Amirabad's potential—a cautionary tale for Anzali. Their analysis revealed that most investments in this zone have concentrated on import-oriented activities like warehousing and silo storage, while production sectors with high export potential - particularly wood and construction materials industries - suffer from underinvestment. The authors further emphasize that sustained collaboration with surrounding geographic areas could enhance zone performance and promote sustainable development. A 2025 study of Tunisia's coastal regions (Khaled, 2025) also investigates how agglomeration economies and dispersion forces—shaped by industrial structure and regional scale—influence regional economic growth. Results confirm that agglomeration economies significantly enhance growth, with pronounced spatial interactions between administrative regions. Diversity, competition, and R&D expenditure demonstrate positive direct and indirect effects on total factor productivity (TFP), whereas specialization exhibits no spatial spillovers.

Comparative studies of SEZs highlight the importance of adaptive governance. Wan et al. (2014) analyze Shanghai's FTZ, where relaxed regulations and financial liberalization spurred systemic economic reforms in China. Similarly, Ji et al. (2015) stressed the need for Hong Kong's FTZ to prioritize tourism-sector investments to maintain synergy with mainland China. These cases underscore the dual role of FTZs as economic bridges and policy laboratories. For Anzali, adopting similar innovations—such as maritime diplomacy (Kheyroddin & Ghadi, 2022) or sustainable tourism frameworks (Tamimi & Rahmani, 2015)—could enhance its competitiveness while addressing Iran's broader economic isolation.

While extensive research exists on free trade zones, previous studies have adopted mainly macro-level performance assessments rather than examining the nuanced dynamics between export-oriented and import-oriented activities and their regional development impacts. A critical lacuna persists regarding (1) the manufacturing-service sector equilibrium within FTZs and (2) rigorous analysis of how trade balance

(export-import ratios) influences employment generation and economic growth patterns. Our study addresses these gaps through a micro-level investigation of the Anzali Commercial-Industrial Free Zone, employing a mixed-methods approach to systematically map activity portfolios, quantify trade balance effects on development indicators, and identify operational constraints versus untapped potentials. The resulting framework proposes evidence-based strategies for enhancing the zone's contribution to regional economic upgrading and national trade competitiveness.

1-2- Definitions of Special Economic Zones (SEZs)

Special Economic Zones (SEZs) are geographically demarcated areas with distinct regulatory frameworks, exempting businesses from domestic taxes, labor laws, and customs duties (Abdel-Wahab, 2024; Farole & Akinci, 2011). While lacking a universal definition, SEZs are widely characterized by incentives like tax exemptions, streamlined customs, and advanced infrastructure to attract investment (World Bank framework: Farole & Akinci, 2011; Figueiredo et al., 2021).

The modern SEZ model originated with the Free Port of Hamburg (1888), which prioritized export-oriented manufacturing under non-competitive conditions with domestic sectors (Mohammadi Al-Mouti, 1995). The concept gained momentum post-1959 with Ireland's Shannon Free Zone and proliferated in the 1970s–1980s as developing nations shifted from import-substitution to export-led growth strategies, particularly in East Asia and Latin America (Mohammadi, 2019). Today, over 100 countries host SEZs, contributing over \$200 billion annually to global exports and employing 40 million workers (Farole & Akinci, 2011).

1-3-The Effects of SEZs and ports on Economic Growth

Export Processing Zones (EPZs) or Free Trade Zones (FTZs), often near ports, focus on duty-free manufacturing/trade (Bahmani & Simbar, 2012; Hausmann et al., 2016). As central hubs, ports stimulate urban development (Liu et al., 2019) and foster symbiotic port-city relationships, anchoring trade while cities leverage industrial/tourism opportunities (Merk & Dang, 2013; Couling & Hein, 2020). Coastal ecosystems underpin 80% of global trade, with ports advancing sustainable development through integrated socio-economic-environmental benefits (Zheng et al., 2020; Okafor-Yarwood et al., 2020). Ports drive regional economic growth through three impacts. The direct impact is cargo handling and facility management (Russoa & Musolino, 2023). The second one is indirect, which is supply-chain linkages via purchases of goods/services (Notteboom et al., 2022). Finally, the last impact is induced, which is household spending by port-linked employees (Russoa & Musolino, 2023).

Ports also advance circular economies by enabling industrial symbiosis and waste-to-resource initiatives (Faut et al., 2023). Their strategic value is quantified through: Gross Value-Added (GVA) to GDP/GRP, employment (FTEs), and trade volumes and fiscal revenue (Notteboom et al., 2022).

1-4-SEZs as Drivers of Growth

Special Economic Zones (SEZs) serve as critical drivers of economic growth, enhancing global competitiveness through export development, FDI attraction, job creation, and policy experimentation (Abdel-Wahab, 2024). Since the 1990s, SEZs have been widely adopted as engines of industrialization, with their global count surpassing 5,400 across 147 countries (World Investment Report) (Aggarwal, 2019), (UNCTAD, 2019). Nations increasingly transform SEZs into advanced industrial and commercial hubs, leveraging incentives to maximize their economic potential (Abdel-Wahab, 2024). In other words, SEZs deliver static benefits such as FDI inflows, job creation, and foreign exchange earnings, which are often prioritized in short-term evaluations (Esposito, 2024). However, their broader success hinges on dynamic impacts, including technology spillovers, human capital development, and industrial upgrading (Farole & Akinci, 2011). By exempting firms from restrictive regulations, SEZs enable late-developing economies to transition from inward-looking policies to global market integration (Keshavarzian, 2010).

For developing countries, integration with neighbouring economies and beyond is essential, providing access to new markets, investment opportunities and more advanced technologies, including most recently through participation in global and regional value chains (United Nations, 2023). By offering investment advantages, SEZs diversify access to foreign markets, empower investor decision-making, optimize local resource utilization (human and material), and modernize production methods—fostering sustainable community development (Abdel-Wahab, 2024).

As targeted policy tools, SEZs concentrate infrastructure investments and regulatory concessions in specific regions to attract large-scale, productive enterprises. This agglomeration spurs local competition, strengthens labor and supply chains, and generates knowledge spillovers that fuel long-term economic progress (Hyuny & Raviz, 2018). SEZs also aim to attract FDI (Hausmann et al, 2016), reforming pilot policy (Farole, 2011; Keshavarzian, 2010), driving diversification and supply-chain integration (Hausmann et al., 2016), and reducing regional disparities (FIAS, 2008).

1-5-Land-Sea Interactions and Sustainability

Port authorities are increasingly prioritizing sustainability investments, driven by ethical imperatives and practical necessities to maintain social legitimacy and global market competitiveness (Adams et al., 2009; de Langen & Sornn-Friese, 2019; Moeremans & Dooms, 2021). Central to this effort is the management of land-sea interactions, where terrestrial and marine systems reciprocally influence port-city sustainability. Port cities function as integrated hubs mediating terrestrial systems (e.g., urban infrastructure, socioeconomic diversity), marine systems (e.g., maritime logistics, ecological health), and human systems (e.g., circular economy practices, community revitalization) to balance economic growth with ecological resilience (Chua et al., 2006; Ogara et al., 2023). Critics highlight risks such as environmental trade-offs and enclave economies, as seen in poorly integrated Special Economic Zones (SEZs), which can undermine long-term sustainability (Abdel-Wahab, 2024; Bahmani & Simbar, 2012). Effective governance must address challenges like site selection, incentive imbalances, and local

integration to avoid prioritizing short-term gains over systemic ecological and socioeconomic health (Farole & Akinci, 2011).

1-6-Port-City Function and Development

Port cities operate through two interconnected systems: the port system, focused on global trade, logistics efficiency, and large-scale infrastructure, and the urban system, which prioritizes socioeconomic inclusivity, ecological balance, and regional connectivity (Ogara et al., 2023). Their development is shaped by three typological factors: the external environment (e.g., globalization, sustainability mandates, geopolitical shifts), spatial organization (e.g., expanded port networks enhancing maritime reach), and organizational strategy (e.g., governance models for integrated logistics and hinterland connectivity) (Notteboom et al., 2022). Ports also operate within transactional networks, competing or collaborating based on location, cost efficiency, and productivity to attract shipping traffic and retain relevance in global trade systems (Notteboom et al., 2022).

SEZs, such as China's manufacturing hubs and Dubai's knowledge-based zones, exemplify the transformative potential of port-city development, though their success depends on adaptability and strong domestic linkages (Hausmann et al., 2016). Ports also operate within transactional networks, competing or collaborating based on cost efficiency and productivity to retain relevance in global trade systems (Notteboom et al., 2022). By integrating industrial-logistic activities with cultural revitalization and circular economy practices, port cities emerge as innovation hubs, fostering sustainable development and attracting human capital (Girard, 2013).

1-7-Conflicts and the role of governments in Port Cities and Special Economic Zones

A smart sustainable port city model integrates circular economy principles and collaborative institutional synergies to ensure long-term viability (Girard, 2013). However, port cities face conflicts arising from environmental harm (e.g., pollution, resource depletion) and tensions between cultural preservation and economic growth (Luigi Fusco Girard, 2013). Addressing these demands innovative approaches to transform conflicts into complementary synergies, fostering a "win-win" balance of economic, social, and environmental values (Girard, 2013).

Effective governance of Special Economic Zones (SEZs) and port cities requires long-term, consistent government support, particularly challenging in nations with short political cycles that prioritize immediate results over sustained investment (Farole & Akinci, 2011). Governance is integral to sustainable port city and marine management, involving complex decision-making processes due to conflicting stakeholder interests embedded in land-sea spaces (Lam & Yap, 2019; DeLangen, 2006). Stakeholders can be profiled based on their spatial priorities—land (e.g., urban development, cultural

preservation) or sea (e.g., maritime logistics, ecological health)—reflecting divergent perspectives (Crossland et al., 2005).

As outlined in Fig. 1, SEZs operate under a dual regulatory framework: national laws and SEZ-specific legislation (e.g., zone laws, decrees). However, regulatory divergence between these layers varies significantly across countries, complicating governance (World Investment Report, 2019,161–162).

Source: (World Investment Report, 2019, page:161–162)

3 Methodology

This study employs a mixed-methods approach to evaluate the performance of the Anzali Free Trade-Industrial Zone (FTIZ) in achieving its core objectives, including export development, import reduction, and sustainable job creation. Quantitative data were collected through a comprehensive analysis of export-import statistics (2009–2017), investment records, and employment figures, while qualitative insights were obtained via in-depth interviews with FTIZ experts and stakeholders, supplemented by observational analysis of systemic challenges such as spatial-economic disparities and operational inefficiencies. The period from 2009 to 2017 was selected for this study for the following reasons. From 2009 to 2013, Iran's economy was fundamentally oil-based. This characteristic significantly influenced the volume of exports and imports due to the substantial influx of current financial resources. However, from 2013 to 2017, in response to escalating economic pressures and the onset of sanctions, Iran's economy transitioned towards a sanctions-contingent structure. It should be noted that oil nevertheless remained one of the principal pillars of the Iranian economy throughout this latter period. Consequently, this specific timeframe was chosen to enable a comparative analysis of import and export conditions within the Anzali Free Zone under two distinct prevailing economic regimes in Iran.

The research process commenced with extracting official data on exports, imports, and investment activities within the Anzali Free Trade-Industrial Zone from authoritative sources including customs administration and the Anzali FTZ Organization. The collected datasets were systematically organized and analyzed through tabular and graphical representations. Subsequently, structured interviews with domain experts and zone administrators were conducted to identify operational challenges and latent opportunities. The study employed the Analytic Hierarchy Process (AHP) methodology implemented via Expert Choice software to prioritize neglected performance dimensions of the Anzali FTZ. This comprehensive methodological approach enabled the study to effectively address its primary research question while establishing a robust analytical framework for evaluating the Anzali Free Trade-Industrial Zone's operational efficacy.

3-1-Case Study: Anzali Free Trade-Industrial Zone

Under Iran's 1993 Free Trade-Industrial Zones Law (Article 1, ratified 28 August 1993), the government establishes zones to accelerate infrastructure, economic growth, and public welfare by attracting

investments, boosting state revenue, creating jobs, regulating markets, enhancing global trade participation, expanding exports, and improving public services. These specialized zones offer foreign investors exclusive incentives, focusing on processing imported raw materials for re-export (Zarghampour & Abbasiyan, 2016).

In Fig. 2, the locations of special free zones in Iran are presented. As of 2021, seven zones are operational, with seven additional zones approved legislatively on 25 May 2021. The current free trade-industrial zones are Kish, Qeshm, Arvand, Chabahar, Maku, Anzali, and Aras. The newly approved free trade-industrial zones also are Sistan, Inche Borun, Ardabil, Baneeh, Bushehr, Jask, and Mehran.

Source:(Authors, 2025)

Anzali, a southern coastal city along the Caspian Sea in Gilan Province, has traditionally relied on agriculture and fishing as its primary economic activities (Gilan Province Road and Urban Development Administration, 2013). Anzali Free Trade-Industrial Zone is strategically positioned along the main axis of the North-South Transport Corridor (NOSTRAC) and is recognized as the northern gateway of this corridor. At the southern end, Iran's Chabahar Free Trade-Industrial Zone serves as the counterpart gateway within the country. The NOSTRAC corridor facilitates Europe-Asia trade, with a significant portion traversing Iranian territory. This route originates at Mumbai Port in India, enters Iran through Chabahar Port, crosses Iranian territory, reaches the Caspian Sea via Anzali Free Zone, and continues toward European countries through the Volga River (Anzali Free Trade-Industrial Zone Organization, 2017).

Investment in the Anzali Free Trade-Industrial Zone has increased in recent years in line with the strategic objectives of the Islamic Republic of Iran to develop relations with Caspian Sea littoral states and maximize use of the North-South Transport Corridor. This includes raising loading capacity at the zone's ports, increasing the number of cargo ships, and significant investment in the Qazvin-Rasht-Anzali railway to connect the free zone to Iran's national railway network.

The Table 1 details the infrastructure and construction investments made between 2009–2017, as documented by the Anzali Free Trade-Industrial Zone Organization.

Table 1

Infrastructure and Construction Investments in Anzali Free Trade-Industrial Zone, 2009–2017

Year (Gregorian)	2009– 2010	2010– 2011	2011– 2012	2012– 2013	2013– 2014	2014– 2015	2015– 2016	2016– 2017	Jan- Jun 2017
Billion IRR	433	348	381	285	163	594	1,046	1,932	925
Source: (Authors obtained from (Anzali Free Trade-Industrial Zone Organization, 2017))									

Two active industrial towns have been established in the zone, directly employing 9,023 people in the production of hygiene products, food items, industrial goods, packaging materials, chemicals, and other

products (Anzali Free Trade-Industrial Zone Organization, 2017).

3-1-3-The advantages of Anzali Free Trade-Industrial Zone

According to the Anzali Free Trade-Industrial Zone Organization (2017), the Anzali Free Trade-Industrial Zone offers critical benefits, including its **strategic maritime position** as Iran's most active Caspian Sea port, equipped with 10 specialized docks handling 6 million tons of cargo annually. Its **transport connectivity** is enhanced by proximity to Rasht's Sardar Jangal International Airport and the development of Caspian Port, Iran's largest Caspian maritime hub. **Geographic advantages** include close access to Tehran, major industrial-population centers, and domestic/international ports. The zone leverages **tourism potential** through its adjacency to the Anzali International Wetland and Caspian coastal areas. Positioned along the North-South Transport Corridor (NOSTRAC), it connects Indian Ocean ports to Helsinki, Finland. Additionally, it benefits from **agricultural and marine resources**, such as Gilan Province's rice, citrus, tea, olives, and silk production, alongside processing facilities for bony and cartilaginous fish reserves.

3-1-4-Investment Opportunities and Incentives in Anzali Free Trade-Industrial Zone

To stimulate foreign and domestic investments, the Anzali Free Trade-Industrial Zone (AFTIZ) has implemented a comprehensive suite of incentives and policies (Anzali Free Trade-Industrial Zone Organization, 2017). These include full capital mobility and foreign investment rights, such as unrestricted capital entry and exit, 100% foreign ownership permissions, and legal guarantees for foreign capital and profit repatriation. Tax and customs exemptions further enhance the zone's appeal: a 15-year tax exemption (extendable to 20 years) applies to businesses, alongside waivers on all customs duties and tariffs for imported raw materials, machinery, and spare parts used in local production. Goods manufactured within the zone also benefit from reduced customs fees when entering mainland Iran, contingent on added value. Trade and transit advantages include unrestricted re-export and transit of goods, duty-free imports, and opportunities for joint domestic-foreign ventures. Visa and entry procedures are streamlined, allowing foreign nationals to enter through designated zone checkpoints without prior visa authorization. Additionally, land ownership policies permit domestic investors to purchase or lease land, while foreign investors may lease land under specified terms. Employment regulations within the zone are governed by distinct frameworks tailored to its economic objectives. Collectively, these measures position AFTIZ as a strategic hub for international trade and industrial activity.

3-1-5-Spatial-Structural Transformations

The Anzali Free Trade-Industrial Zone (FTIZ) is one of Iran's seven special economic zones, located in Gilan Province. Established in 2005 under a Cabinet decree, the zone initially covered 3,200 hectares across Anzali and Rasht counties. Following the 2013 administration change, the zone underwent significant expansion in alignment with national development goals. Its jurisdiction expanded to include three counties (Rasht, Anzali, and Astaneh-ye Ashrafiyeh), encompassing 9,600 hectares of land area plus a 2 km maritime zone extending 20 km along the Caspian coastline at 21 meters above sea level (Tamimi & Rahmani, 2015). An analysis of aerial imagery of the Anzali Free Trade-Industrial Zone from its establishment to 2017 reveals significant physical-spatial changes in recent years.

In the following Fig. 3, the zone's initial layout in 2005 is compared with its expanded structure in 2017(Google Earth, 2017).

Source: (Authors obtained from Google Earth, access date: 2025/4/20)

3-1-6-Performance Evaluation of Anzali Free Trade-Industrial Zone (imports and exports)

This section analyzes the performance of the Anzali Free Trade-Industrial Zone (FTZ) in the areas of exports, imports, and industrial production during the period from 2009 to the second half of 2017. The export and import data of a free trade-industrial zone reflect its overall economic performance. The trade statistics of Anzali FTZ can be categorized into several sectors, as explained in the following part (Anzali Free Trade-Industrial Zone Organization, 2017). Considering that Anzali County has two distinct customs offices (Anzali County Customs and Anzali Free Zone Customs), two separate sets of trade statistics are reported for total exports and imports passing through Anzali.

An examination of export and import trends from 2009 to 2017 shows a decline in import volumes over these years, while export volumes have remained constant. Notably, export volumes remain significantly lower than imports. Imports began declining in 2013 as Iran's economy transitioned towards a sanctions-contingent structure, largely due to sanctions-induced reductions in oil revenues.

Chart1

The export and import volumes of all Anzali customs offices from 2009 to 2017

Source:(Authors obtained from (Anzali Free Trade-Industrial Zone Organization, 2017))

The export and import data from Anzali Free Zone Customs for the period between 2009 and 2017 reveals several key trends. Import volumes have shown a consistent increase throughout these years, while export volumes have remained relatively stable. In 2013–2014, the ratio of imports to exports stood at approximately two to one. However, by this ratio had significantly widened in 2016–2017 to nearly five to one, indicating a growing trade imbalance.

Chart2

The export and import volumes of Anzali customs office from 2009 to 2017

Source:(Authors obtained from (Anzali Free Trade-Industrial Zone Organization, 2017))

The comparison of the two aforementioned charts indicates that while total import volumes to the country have declined, imports through Anzali Free Zone Customs have increased in recent years due to the diverse exemptions and incentives offered in the zone.

The primary objective of establishing free zones is the economic development of the region itself and, consequently, the entire country. Statistics on the exports and imports of the zone's production can demonstrate the financial impact of the free zone within the region, as well as its effect on local employment. These export statistics can be divided into two charts, which are combined for better comparison. One of them, which is in orange, pertains to the export of goods produced in the zone to foreign countries, referred to as outright exportation, while the other represents the export of goods produced in the zone to the domestic market, known as exports to the mainland.

Chart3

Statistics on Final Goods Exports (outright exportation) and on Exports of Manufactured Goods to the Mainland

Source:(Authors obtained from (Anzali Free Trade-Industrial Zone Organization, 2017))

The statistics indicate that the volume of exports has increased to 2017. In 2016–2017, final goods exports (outright exportation) amounted to 55 million, while exports to the mainland reached 124 million, reflecting employment growth in the region. According to 2016–2017 data, 9,023 direct jobs were created in the Anzali Free Zone, with workers employed in Industrial Zones 1 and 2 of the area. As highlighted in the study by Kheyroddin and Ghadi (2022), special economic zones with high export potential can serve as driving engines for regional economic development. However, in the Anzali Free Trade-Industrial Zone, despite having similar capacities, a significant portion of investments has been directed toward import-oriented activities such as warehousing and silo storage. This indicates that achieving export-oriented objectives requires revising investment attraction policies and placing greater emphasis on manufacturing sectors.

3-1-7-Analysis of the Export-Import Balance in the Region and Its Overlooked Dimensions

The Anzali Free Trade-Industrial Zone, given its strategic location on the Caspian Sea coast and access to the North-South Corridor, possesses significant potential for export-import development. However, an analysis of the zone's trade balance reveals challenges in its export-import performance. In this section,

through focused interviews with key stakeholders (including experts and managers from the Anzali Free Trade-Industrial Zone and its central office at the Supreme Council of Free Trade-Industrial Zones), the overlooked dimensions of the Anzali Free Zone's performance are examined.

Insufficient attention to the processing of fisheries and agricultural products in the Anzali region and Gilan Province: As one of the country's main hubs for agricultural and fisheries production, Gilan Province has significant potential for developing processing and value-added industries. However, the Anzali Free Zone has failed to fully capitalize on these opportunities. Most activities in the zone are concentrated on importing consumer goods and warehousing, while productive sectors such as processing and value-added industries for local products suffer from underinvestment. This has prevented the zone from fully leveraging its comparative advantages in exporting local products.

While the laws and regulations governing free zones are sound in principle, their execution faces significant challenges. A key issue is the lack of clear provisions for generating sustainable revenue streams. Currently, the Anzali Free Zone primarily relies on customs duties and commercial profits, whereas developing production-oriented and export-driven activities is crucial for sustainable income. Furthermore, poor enforcement of investment attraction policies, inadequate trade facilitation, and insufficient infrastructure development have collectively prevented the zone from fully capitalizing on its potential.

As illustrated in Fig. 4, Anzali Free Zone enjoys a strategic geographical position as a key gateway to the North-South Transport Corridor (INSTC). However, inadequate infrastructure development along this corridor has prevented the zone from fully capitalizing on this advantage. Particularly, the lack of rail connectivity to Iran's national railway network and insufficient cargo-handling capacity at port facilities have diminished the corridor's appeal to international traders and businesses.

The elevated costs of goods transit in Iran present another significant challenge for the Anzali Free Zone. Customs tariffs and transportation expenses in Iran remain substantially higher than in most regional countries, undermining the zone's ability to compete for international trade (Tehran Chamber of Commerce, Industries, Mines & Agriculture, 2013). The Anzali Free Zone holds considerable potential to expand regional trade through establishing formal trade agreements with neighboring states and reducing transit tariffs. Yet, the persistent lack of emphasis on regional collaboration and failure to implement such agreements have significantly limited the zone's capacity to realize its full international trade potential (Short, 2007). This disregard for regional partnership opportunities - particularly in border areas - has inadvertently fostered the expansion of informal economic activities, including increased smuggling operations and unregulated imports of certain products (Kheyroddin & Razpour, 2016). By developing formal economic cooperation frameworks and creating structured trade mechanisms through special economic zones, authorities could simultaneously address multiple challenges: reducing illicit trade flows while creating sustainable employment opportunities, enhancing local economic conditions, and promoting stability in border communities.

One of the expected characteristics of commercial free and special economic zones is their association with international functions, sustained utilization, and high-efficiency use of operational capacities. These zones should ideally remain vibrant, active, and engaged in continuous import-export activities and trade (Khorsand et al., 2020). This entails 24-hour operations through transportation and customs centers, hotels, restaurants, warehouses, parking facilities, and diverse land uses, presenting a dynamic and novel image akin to 24-hour cities. However, most SEZs and FTZs—particularly the Anzali Free Economic Zone—fall short of these expectations. Instead of functioning as bustling economic hubs, they often operate within limited hours, akin to government offices, failing to exhibit sustained vitality or productivity. This is paradoxical, as such zones are intended to serve as dynamic economic engines driving the development of coastal regions and border cities. Permanent 24-hour activity across diverse land uses (Khorsand et al., 2021) could enhance the economic returns relative to investments in these zones. Unfortunately, the low-efficiency operational patterns typical of state-run economic centers have permeated the functionality of these zones—an issue that demands urgent attention.

Special economic zones frequently exhibit poor spatial and functional integration with their surrounding areas. Although their unique regulatory frameworks regarding finance, customs, and taxation necessarily create distinctions, these should not result in complete spatial segregation (Kheyroddin, 2010). Empirical research demonstrates that enclosed industrial parks and residential compounds - particularly in coastal and border regions - actively disrupt connectivity through physical barriers like walls and fences, creating spatial segregation between the zones and surrounded areas (Kheyroddin & Hedayatifard, 2017). This isolation often reflects deliberate planning decisions by private developers aiming to establish exclusive enclaves with perceived higher socioeconomic status. However, such approaches ultimately generate significant spatial and social fragmentation, exacerbate class divisions (Mokhtarzadeh et al., 2019), and undermine broader urban integration. The situation becomes particularly complex when profit-oriented private entities drive development, as their focus on short-term returns frequently overlooks long-term, balanced growth strategies (Kheyroddin & Hedayatifard, 2015, 2017). Given that public authorities retain responsibility for zone planning and location decisions, they must prioritize policies that minimize physical barriers, enhance functional connectivity, and prevent socioeconomic segregation. This requires careful consideration of how special economic zones interact with their surroundings, ensuring they contribute to rather than detract from regional development.

3-2-Prioritizing Key Considerations in the Region's Export-Import Operations

Based on interviews conducted with experts from the Anzali Free Trade-Industrial Zone and the Supreme Council of Free Zones, the results were analyzed using the Analytic Hierarchy Process (AHP) and paired comparisons via Expert Choice software. Table 2 shows the paired comparison between factors. This determined the relative importance of each factor influencing the region's conditions, followed by their prioritization.

Table 2
Prioritization Matrix (Paired Comparisons)

Factor	Improper enforcement of laws	Lack of focus on value-added processing	North-South Corridor	High transit costs	Regional cooperation
Improper enforcement of laws	-	2.0	3.0	4.0	6.0
Lack of focus on value-added processing	-	-	2.0	3.0	4.0
North-South Corridor	-	-	-	3.0	2.5
High transit costs	-	-	-	-	2.0
Regional cooperation	-	-	-	-	-

Based on the conducted analyses, inadequate enforcement of regulations with a score of 0.422 has been identified as the most significant challenge facing the region. This is followed by insufficient attention to processing of fisheries and agricultural products (0.257), inadequate focus on the North-South Corridor (0.177), high transit costs (0.088), and limited regional cooperation (0.056) in subsequent rankings. This prioritization indicates that non-compliance with Anzali Free Trade Zone regulations represents one of the most critical obstacles to the region's development. Secondary challenges include neglecting the region's comparative advantages, particularly in agriculture and aquaculture sectors. Addressing these sectors could enhance local employment and boost both domestic and international exports. At the macro level, failure to develop the North-South Corridor infrastructure, despite Anzali Free Zone's strategic position along this route, constitutes another crucial consideration for future development planning.

4 Conclusion: Hoping to Export vs Import Realities

This study examined the performance of Anzali Free Trade-Industrial Zone in terms of exports, imports, and their impacts on regional and national economic development. The results revealed that despite its strategic advantages, Anzali Free Zone continues to face challenges including inadequate enforcement of regulations, insufficient attention to local product processing, and weak infrastructure related to the North-South Corridor. These challenges have prevented the zone from fully achieving its primary objectives of export development and sustainable job creation.

As mentioned in the study by Kheyroddin and Ghadi (1401), strengthening production-oriented and export-focused activities in special economic zones can help achieve endogenous regional development. For the Anzali Free Trade-Industrial Zone, it is suggested that by attracting investment in processing and value-added industries for local products such as fisheries and agriculture, establishing

industrial clusters, and strengthening maritime diplomacy, the region can boost exports and production. These measures could not only lead to increased employment and foreign currency earnings, but could also enhance the zone's role as an important trade center in the North-South Corridor. To improve the performance of Anzali Free Zone, special attention should be paid to the following key directions.

The revision and strict enforcement of existing regulations should aim to curb unnecessary import-oriented activities while simultaneously strengthening production and export-focused operations. Policymakers and planners responsible for developing free economic and trade zones must conduct necessary studies and carefully consider these zones' operational impacts on surrounding areas. Certain regulatory controls governing access to these zones impose specific procedures on the movement of individuals and the exchange of goods and services. However, the unilateral application of these regulations often results in the construction of massive, costly perimeter walls and barriers. These structures not only visually and physically isolate the zones but also completely sever any connection between external observers and internal activities. Consequently, populations outside these zones remain entirely unaware of operations within, creating a divide where both sides become mutually alienated (Kheyroddin & Ghadi, 2022). A clear example of this spatial segregation can be seen in the concrete barrier walls of the Amir Abad Special Economic Zone and its surrounding areas along the southeastern Caspian Sea coast, highlighting the profound disconnect between these zones and their adjacent regions.

By focusing on the region's comparative advantages and investing in key sectors such as fisheries, agriculture, and processing industries, the local potential of the area can be fully utilized. Enhancing transportation infrastructure, particularly by connecting the zone to the national railway network, would strengthen its role in the North-South Corridor. Additionally, expanding regional cooperation through trade agreements with neighboring countries and reducing transit tariffs could significantly boost the zone's trade volume. Given its strategic location, Anzali Free Trade-Industrial Zone possesses considerable potential to emerge as a major commercial and economic hub in northern Iran. However, realizing this potential requires meticulous planning, proper implementation of regulations, and a strategic focus on the region's comparative advantages.

Declarations

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The authors declare that no funds, grants, or other support were received for this manuscript.

Ethical Compliance and Informed Consent

This study received an official exemption from requiring a formal ethical approval certificate from the Department of Urban and Regional Planning at Iran University of Science and Technology. The exemption was granted because the research involved non-sensitive interviews with public-sector experts and officials, focused solely on factual questions about institutional policies, procedures, and operational

knowledge. No personal, private, medical, or sensitive human subject data was solicited or recorded. The processes, findings, and conclusions of the study do not involve any conflicts with the rights of identifiable individuals, as confirmed by the University authorities.

All research was, nevertheless, performed in accordance with relevant ethical guidelines and regulations, including the Declaration of Helsinki. Semi-structured interviews were conducted with expert professionals from the Anzali Free Trade-Industrial Zone and the Council of Free Zones.

Informed Consent

Informed consent was obtained from all individual participants included in the study. Prior to participation, all interviewees were fully informed about the study's objectives, the anonymous use of the data, and their unconditional right to withdraw at any stage. Explicit oral informed consent was obtained from each participant after this explanation. Oral consent was deemed appropriate and sufficient to ensure no personal identifiers were recorded or stored, thereby upholding anonymity and confidentiality. The consent process and interviews were conducted between January 15, 2023 and April 30, 2023.

To ensure participant anonymity, no personal identifiers (e.g., names, specific positions, contact details) were recorded at any point during data collection, transcription, or analysis. The content of the dialogues concerned the commercial and economic aspects of the Anzali Free Trade Zone—data typically aggregated in public reports—and was compiled strictly to avoid any connection to private or personal information.

Data availability statement

The data that support the findings of this study consist of anonymized transcripts of expert interviews. These data are available from the corresponding author upon reasonable request. The data are not publicly available only due to the lack of public deposition, but they will be provided promptly for academic and research purposes.

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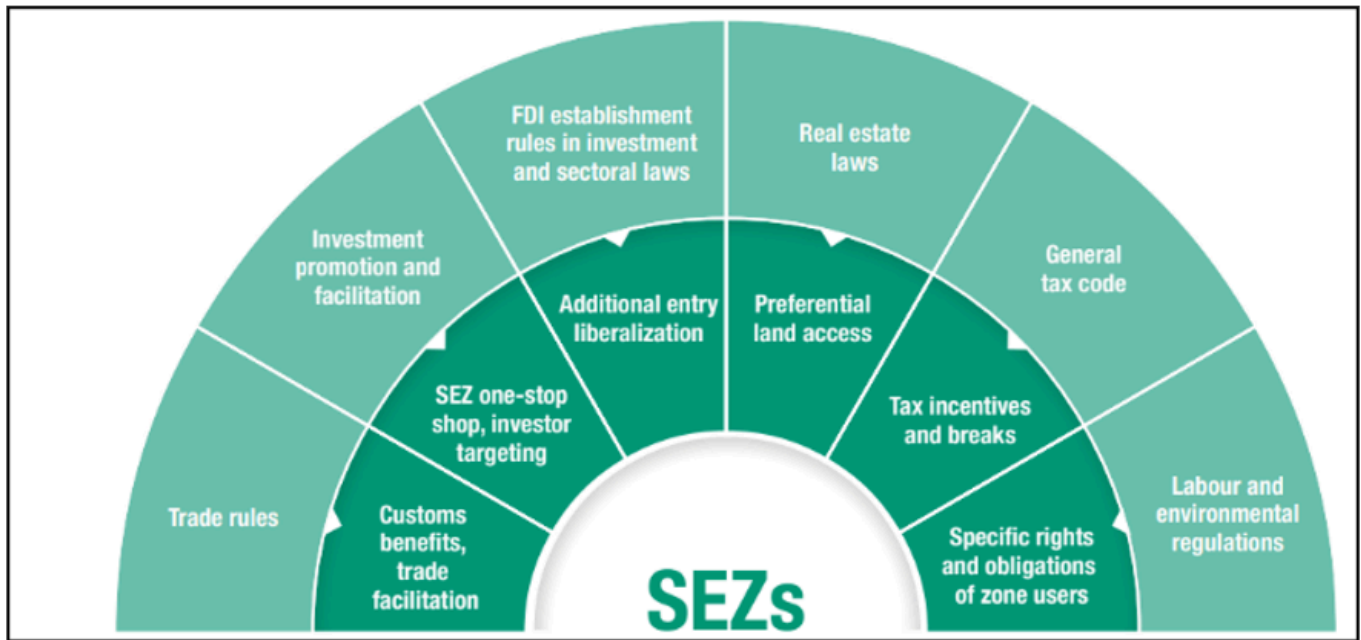
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Charts

Charts 1 to 3 are available in the Supplementary Files section

Figures



Source: (World Investment Report, 2019, page:161-162)

Figure 1

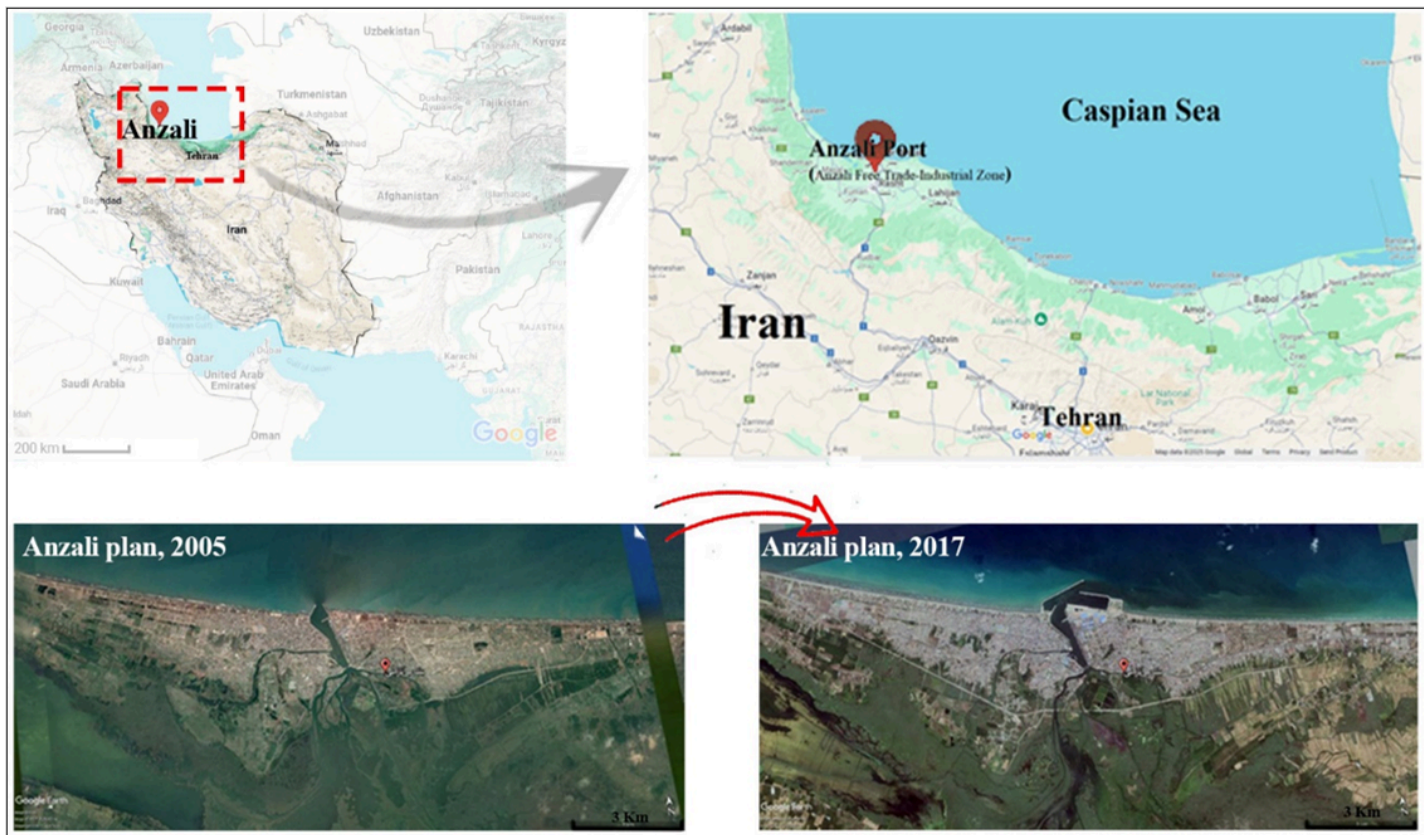
The main elements of the regulatory framework of SEZs



Source:(Authors, 2025)

Figure 2

Iran's Free Trade-Industrial Zones



Source: (Authors obtained from Google Earth, access date: 2025/4/20)

Figure 3

Anzali map from 2005 to 2017



Figure 4

North-South Transport Corridor (INSTC) Route

Supplementary Files

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