POST-CONFLICT ECONOMIC RECOVERY IN SYRIA THROUGH AN ORGANIZED INDUSTRIAL ZONE APPROACH:

Pre-Feasibility Study for the Idlib Organized Industrial Zone (OIZ)

November 2025

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1 Introduction

This report aims to assess the feasibility of implementing an Organized Industrial Zone (OIZ)-based model for the post-war economic recovery process in Syria, using the example of Idlib. The study first addresses the framework of OIZ-focused economic revitalization, followed by a presentation of the profile of Syrian-partnered companies operating in Turkey and the findings from the "Business Conditions in Syria" survey conducted by TEPAV.

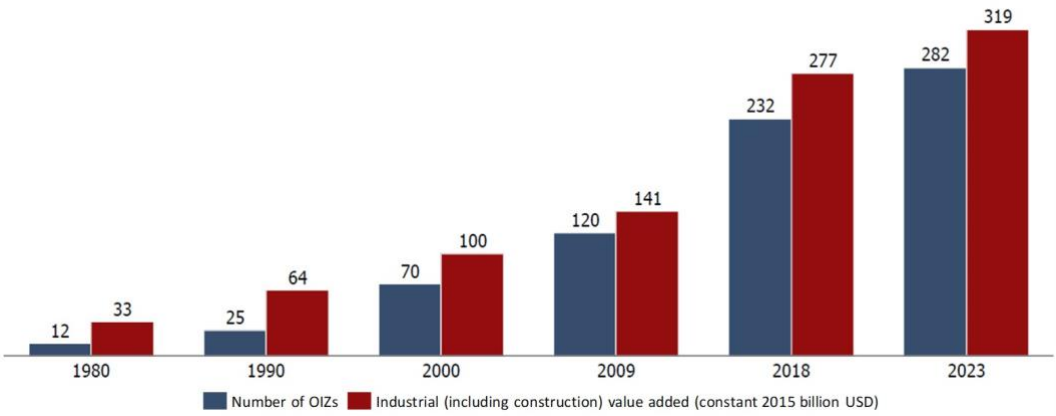
In the subsequent sections of the report, this framework is concretized for the Idlib region. First, Saraqib's logistic position is analyzed through its proximity to the M4 and M5 corridors, ports, the airport, and Turkish border gates. This is followed by an evaluation of the land, property, and planning status, and an exposition of the current conditions and needs regarding energy, water, wastewater, telecommunication, and social-institutional infrastructure, based on findings from field visits and interviews. The succeeding sections technically examine Saraqib’s soil, climate, and disaster risk profile, summarize the preliminary design and functional area setup prepared for the pilot OIZ area, and finally, present economic feasibility calculations based on different investment scenarios, discussing the overall viability of the Idlib OIZ project within a holistic framework.

1.1 OIZ-Focused Approach in Syria's Economic Recovery Process

OIZs are planned industrial areas developed under the leadership of the private sector and with the participation of local actors. During the establishment process, the entrepreneur committee applies to the relevant ministry to obtain site selection approval, followed by expropriation and land subdivision (parcellation) procedures. Local administrations bring essential infrastructure such as electricity, water, roads, communication, and similar services to the selected area. Licensing, permits, and other bureaucratic processes are coordinated through the OIZ management, following a single-window principle. This model helps reduce multiple ownership issues, accelerates land production, simplifies bureaucracy for the investor, and makes access to public services predictable. Consequently, OIZs offer an institutional framework that enables increased production capacity, revitalized investments, and a rise in industrial value added.

OIZs, which began to be established especially since the 1960s, have played a decisive role in Turkey's industrialization process. With the proliferation of OIZs, the country's industrial value added has steadily increased. Indeed, the number of operational OIZs rose from 12 in 1980 to 282 as of 2023. During the same period, industrial value added increased from 33 billion USD to 319 billion USD.

Figure 1 Number of OIZs in Turkey and the Development of Turkey's Industrial Value Added, 1980-2023



Source: World Bank, OSBÜK, TEPAV visualizations

In the context of Syria, disruptions in access to basic public services, high uncertainty, and a fragmented administrative structure are among the main factors complicating the revival of production activities in the post-war period. An OIZ model implemented under these conditions is expected to allow limited public resources to be concentrated and utilized in specific focus areas, and infrastructure to be completed in priority production centers. If OIZs with prepared infrastructure, clarified security arrangements, and simplified administrative processes are established, investors' risk perception will decrease, and production decisions will rest on a more predictable basis. This will encourage formal production, ensuring that businesses are clustered in specific industrial zones instead of operating in scattered and insecure areas, thereby contributing to the reorganization of economic activity.

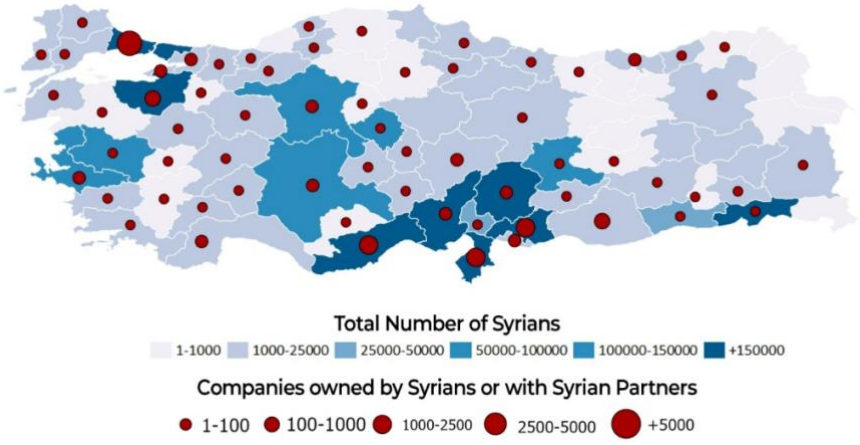
The OIZ model also offers a framework that will support economic recovery in terms of regional employment and the country's industrial value added. Planned industrial plots and complete common infrastructure will provide an environment where firms can produce with lower fixed costs and increase their production capacity. This will not only directly boost industrial employment but also enable the creation of indirect employment through supply chains, logistics, maintenance-repair, security, food and beverage, and other service activities. An applied OIZ model will contribute over time to an increase in industrial production and, consequently, a rise in regional income levels. Within this framework, OIZs are planned not only as an area for firms' investment and production but also as one of the key vehicles for the economic recovery process through increased employment and industrial value added.

1.2 Syrian Companies in Turkey and Findings from TEPAV's Survey on Business Conditions in Syria

There are a large number of Syrian-partnered Turkish companies operating in Turkey. These companies have the potential to play a significant role in Syria's economic revitalization. Out of the 34,210 Syrian-partnered companies established since 2010, 12,635 consist entirely of Syrian partners. Approximately 30,135 companies are currently active, with 5,123 operating in the manufacturing industry and the remainder in the trade and services sectors. These businesses are concentrated particularly in border and logistics hubs such as Gaziantep, Hatay, Mersin, Şanlıurfa, Kilis, Adana, and Kahramanmaraş, forming important links in the supply chains targeting both the Turkish domestic market and regional

countries, especially Syria. In this context, Syrian-partnered Turkish companies have the potential to contribute directly to OIZ-focused economic revitalization plans.

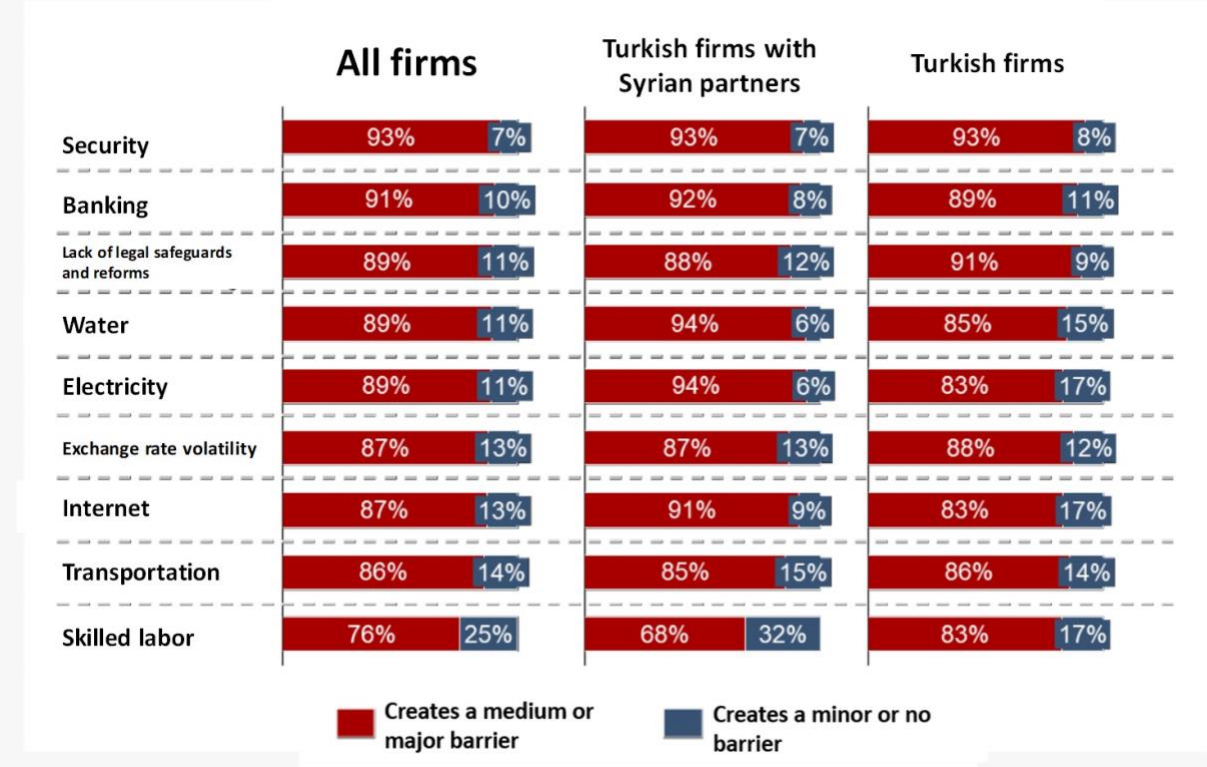
Figure 2 Distribution of Syrian Population and Companies* in Turkey, 2024



**"Syrian companies" represent companies owned by Syrians and/or companies with Syrian partners*
Source: TOBB, TEPAV calculations

To quantify this general framework and better understand the plans of Syrian companies concerning Syria, a large-scale field survey titled "Business Conditions in Syria" was conducted on March 7, 2025, covering 1,024 Turkish and 1,005 Syrian business people in the provinces of Kahramanmaraş, Şanlıurfa, Kilis, Gaziantep, Hatay, Mersin, and Adana. The study primarily targeted Syrian-partnered Turkish companies and Turkish firms operating in the same ecosystem, generating detailed data on firm profiles, trade networks, intentions to invest in Syria, and possible return scenarios. When this quantitative study is evaluated alongside findings from interviews conducted by TEPAV in March 2025 with Syrian-partnered Turkish firms in provinces like Ankara and Mersin, it presents a holistic picture directly reflecting the key expectations and conditions shaping the decisions of Syrian-partnered companies operating in Turkey to return or reinvest in Syria. The survey results reveal that more than half of these firms—approximately 53.9%—are considering opening a business in Syria in the future, thus planning to expand their operations into Syria or make a partial return. The fact that this rate was only 28.3% in the previous study conducted in the same provinces in 2018 indicates a significant strengthening of the desire to return to or reinvest in Syria over time.

Figure 3 Barriers to Doing Business in Syria, 2025



"Syrian companies" refer to the firms owned by Syrians and/or firms with a Syrian partner.

Source: TOBB, TEPAV calculations

Findings from both the survey and the focus group/interview findings indicate that the most critical factor in realizing this intention is access to secure, well-established industrial zones with a completed infrastructure and a clear administrative framework. When asked about the obstacles to doing business in Syria in the survey, 94% of firms with Syrian partners rated water and electricity infrastructure, 93% rated security conditions, 92% rated access to banking services, and 91% rated the lack of internet infrastructure as a medium or high-level barrier. This picture reveals that these enterprises will be much more willing to shift some or all of their production to Syria and make new investments, provided that the continuity of electricity, water, road, and communication infrastructure, the functionality of customs and logistics links, and the predictability of license-permit processes are ensured. Furthermore, other prominent areas of need include access to finance, logistics and customs regulations that will facilitate the transfer of existing machinery and equipment to Syria, access to the Turkish banking system, and vocational training programs to support skilled labor. In this context, OIZs to be designed in Syria will function not only as an attraction center for new investors but also as a critical institutional mechanism that will facilitate the return of Syrian capital and entrepreneurial capacity currently operating in Turkey to their country and their integration into the economic recovery process. For this mechanism to become functional, the simultaneous construction of secure and infrastructure-strong OIZs, alongside the financial and institutional framework supporting them, will emerge as the fundamental prerequisite for the return and investment process.

2 Idlib as a Pilot Region

The objective here is to operationalize the Organized Industrial Zone (OIZ)-based economic revitalization framework developed in the previous sections with specific reference to the Idlib region of Syria. In the following subsections, the logistical position and accessibility of the Saraqib region will be analyzed, findings from field surveys and interviews will be summarized, land and ground conditions along with the planning framework will be evaluated, possible preliminary design options for the OIZ will be discussed, and finally, economic feasibility estimates based on different investment scenarios will be presented.

2.1 Logistic Assessment of the Idlib Region

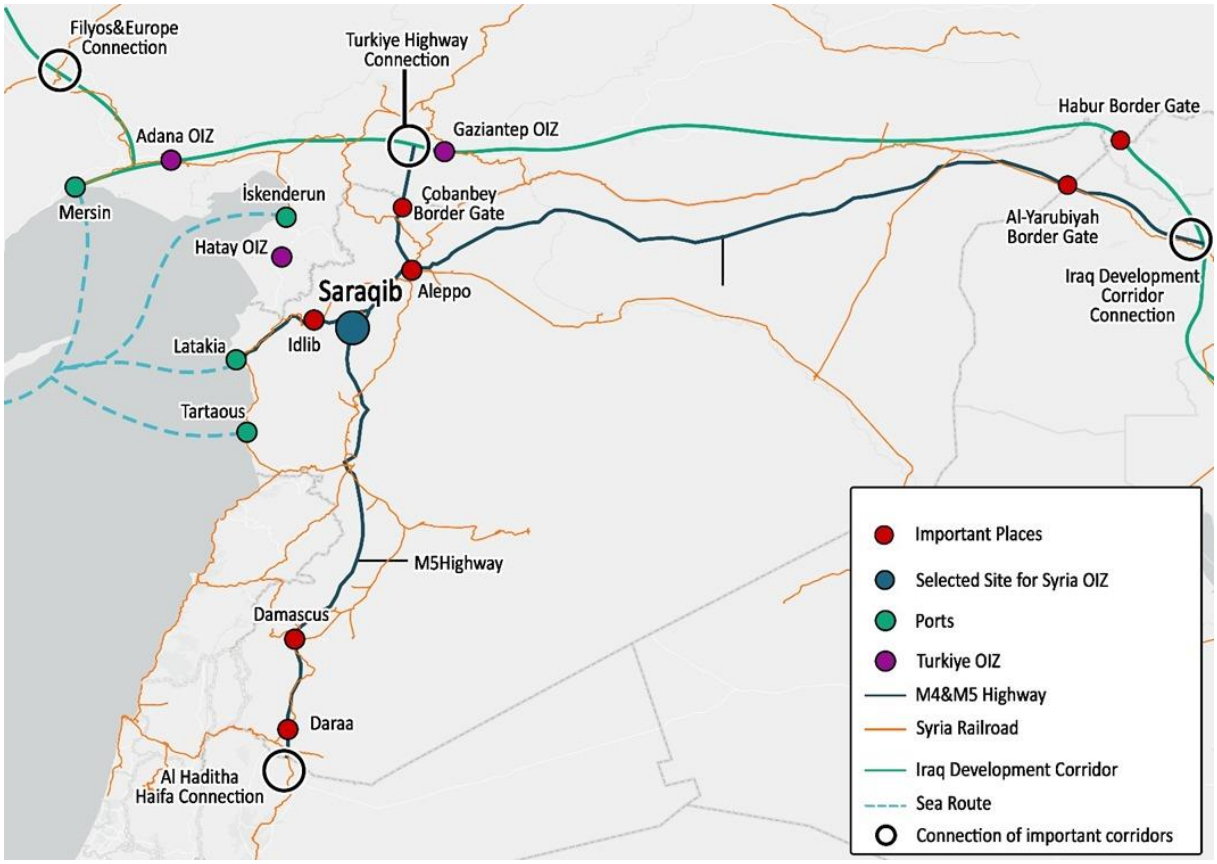
Saraqib's proximity to the intersection of the M4 (East–West) and M5 (North–South) corridors, which are the two main arteries of the Syrian road network, offers a strong logistical basis for a potential OIZ investment. The M4 is the main East–West corridor, starting from the Port of Latakia, passing near Jisr al-Shughour and Idlib, extending to Aleppo via the Saraqib junction, and then connecting to the East of the Euphrates and the Iraqi border via the Raqqa line. Due to its status as the primary route between the Port of Latakia on the Mediterranean coast and the inner and eastern regions of Syria, it is critically important for the transportation of foreign trade, agricultural, and industrial products. The M5 is the main North–South connection road, starting from Daraa on the Jordanian border, reaching Aleppo via Damascus, Homs, and Hama, and connecting the country's major cities along a single axis. The concentration of a significant portion of the population and economic activity along this axis makes the M5 decisive for both domestic trade and transit transport along the Jordan–Syria–Turkey line. In this framework, Saraqib functions as a logistics hub where these two main arteries, which open both to the Syrian domestic market and to external markets via sea and road, intersect. Its distance of approximately 17–20 km from Idlib city center, approximately 50 km from Aleppo, and approximately 1 km from Saraqib center will enable goods produced in the planned OIZ project to access both local consumption centers and Aleppo, one of the country's most important industrial and labor basins, within a short distance. The road connection provided via the M4 and M5 corridors to the Cobanbey border gate on the Turkish border is expected to facilitate the integration of an OIZ established in Saraqib into the Turkish market and, from there, into wider regional markets. This is projected to allow goods produced in the OIZ to be transported to road export routes with competitive transport times and costs.

In terms of maritime connections, Saraqib's location approximately 100 km from the Port of Latakia and approximately 135 km from the Port of Tartus via the M4 highway provides suitable port access for the goods that will be produced and exported from the OIZ. These distances indicate a scale that is conducive to the planning of daily truck and lorry services by road transport. In the medium term, with the strengthening of the road connection towards Tartus, the OIZ will be able to utilize two different ports. This will increase the opportunities for firms to compare freight costs, utilize different line and route options, and conduct foreign trade operations more flexibly.

Being approximately 50 km from Aleppo Airport and the planning of a new airport investment 25 km away from the region can be considered an additional advantage that paves the way for the use of air cargo in the medium term, particularly for high value-added, time-sensitive, or low-volume products. Saraqib's advantageous location is not limited solely to the Syrian internal road network. Its relative proximity to the Turkish border and land customs gates such as Bab al-Hawa allows products manufactured in the OIZ to be directed to both Mediterranean ports in Turkey (İskenderun, Mersin, etc.) and the extensive OIZ network within Turkey. This enables the development of a production and supply structure where certain production stages are completed in Saraqib, and other stages are completed in OIZs operating in Turkey, particularly in Gaziantep, Hatay, Adana, and the surrounding

areas. Such a structure would allow firms, especially those with Syrian partners in Turkey, to gain flexibility in terms of cost and capacity by shifting some production processes to Saraqib, and it would allow firms in Saraqib to establish closer and more regular relationships with Turkey's logistical, financial, and commercial infrastructure.

Figure 4 Idlib Logistics Map



Source: TEPAV visualizations

On the other hand, the effective non-existence of a railway connection as of today, uncertainties regarding customs and border management, and road maintenance and repair needs stand out as constraints that must be managed carefully to fully realize Saraqib's logistical potential.

Therefore, the logistical superiority of the Idlib OIZ will depend not only on its geographical location but also on the strengthening of the road infrastructure, the clarification of institutional integration with border gates and ports, the co-planning of logistics service providers with the OIZ, and the structuring of medium-to-long-term transportation investments within a consistent framework. If these conditions are met, Saraqib holds the potential to become a powerful logistics hub in the post-war period, both in reorganizing internal Syrian production networks and in integrating into regional value chains, especially with Turkey.

2.2 Assessment of the Idlib Field Survey

In this section, the findings of the field visit and field survey conducted on 2–3 November 2025 in the city center of Idlib and the town of Saraqib, Syria, by a team led by Prof. Dr. Serhat Erkmen, are evaluated. The team examined the proposed site and its surroundings to assess the site's suitability as

a pilot OIZ, and collected information on the topics evaluated below through a structured field form[1]. During the visit, meetings were held with a technical delegation led by the governor's advisor responsible for investments at the Idlib Governorate and the Deputy Mayor f Idlib.

2.2.1 General Location and Strategic Importance of the Region

Saraqib, a settlement in Idlib province in northwestern Syria, stands out for its proximity to the intersection of Syria's main highways, the M4 and M5. This location, which connects the Aleppo-Latakia and Aleppo-Damascus lines, is a critical junction for trade flows within Syria and those connected to Turkey. The area, where pre-feasibility studies for the establishment of an organized industrial zone are being conducted, is approximately 20 km from Idlib city center, approximately 50 km from Aleppo, and approximately 1 km from Saraqib city center. Its location creates a strong accessibility advantage for both local and regional production and trade. The location of the village of Trona, approximately 100 meters from the organized industrial zone, can also be considered a positive factor in terms of labor supply and daily logistics (services, catering, etc.).

In the pre-civil war period, industrial projects focused on stone quarrying were planned in Khan al-Sabil and Maarat al-Numan, located near Saraqib, but these had not yet been approved. The planned dry port investment, located approximately 4 km away, stands out as an important opportunity that could enable the OIZ to acquire multimodal transportation capability in the medium term.

2.2.2 Land, Property, and Planning Status

The OIZ site considered here is a state-owned land parcel of approximately 1 million m² (1,150 dönüms), characterized by flat, rocky topography. The land was previously used for agricultural research purposes and is currently public property with Free Trade Zone status.

- Although the boundaries of the area were established and fenced before the war, the existing walls are largely damaged. Reconstruction of the walls is planned within the scope of the projects envisaged for the region.
- Adjacent to the land, there are approximately 160 decares of private property owned by different parties. If expropriation is carried out, this area offers potential for expansion, auxiliary services (logistics, storage, housing, commerce), or mixed-use development.

In terms of property transfer and investment model, arrangements are primarily expressed to be of the "build–operate–transfer" type. However, there is flexibility regarding both property transfer and long-term leasing/sale options, and the final framework should be negotiated with Mr. Kutayba Ahmed Badawi, Director of the General Authority of Land and Sea Ports, and relevant authorities.

The land currently hosts a two-story building and two water wells. These structures could be utilized as the administrative center, management office, or temporary construction/operation units during the development phase of the OIZ.

From a planning perspective, there is a zoning plan for the area, although its details are open to negotiation with the investor. For technical parameters such as floor area ratio and building coverage ratio, compliance with "international standards" is emphasized, indicating that factory buildings can be shaped according to functional requirements. However:

- The authority to grant construction and operating permits,
- The duration of processes and the fee structure,

[1] The structured field form is presented in the annex

- The number of required documents and procedural burden

are not yet fully determined in written procedures, and these matters are expected to be detailed with Kutaybe Ahmet Bedevi at a later stage.

2.2.3 Transportation and Logistics Infrastructure

2.2.3.1 Highway

The distance of the OIZ to the M4 and M5 junction roads is approximately 600 meters. A 300-meter-long access road to connect to the M4 has been planned. The existing road is asphalt but is narrow (5–6 meters) and requires repair and reinforcement. In the medium term, the road width is planned to be extended to 30 meters.

Maintenance and expansion work is ongoing on the Saraqib–Ariha road. This route will become one of the main axes for both the movement of local producers and labor, and for inter-regional transportation. Furthermore, planned improvements in the direction of Bab al-Hawa and the restoration of rest areas on the highway are complementary in supporting logistics and transportation activities.

2.2.3.2 Port and Airport Connections

- Maritime Access: The distance from Saraqib to Latakia Port via the M4 motorway is approximately 100 km. This distance can be considered an appropriate/reasonable proximity for the access of export products to the sea route.
- Airway Access: The distance to Aleppo Airport is approximately 50 km. Furthermore, it is stated that a new airport investment is planned 25 km away from the region.

2.2.3.3 Railway

Currently, there is no international railway line directly connecting the region. The old railway line passing through the region has been decommissioned, and the new line foreseen to replace it is still in the planning stage. The nearest station is the Abu Duhur Station, which is currently non-operational and was previously used only for domestic transportation between Damascus and Aleppo; it is approximately 35 km away from the region. Therefore, the railway connection is not expected to be a determining factor in the development of the OIZ in the short term. Nevertheless, the development of railway infrastructure in alignment with national transportation strategies carries significant potential to increase the region's accessibility and investment appeal in the medium and long term.

2.2.3.4 Logistics Services and Truck Parking Area

It has been stated that there are international transportation companies operating in Idlib. Furthermore, if the project is realized, the establishment of a truck parking lot and a general car park is expected in the area.

2.2.4 Energy, Water, and Environmental Infrastructure

2.2.4.1 Electricity

A transformer center is located approximately 1 km away from the Idlib OIZ area, and it is stated that electricity will be supplied from this source. The capacity of the external grid is noted as "sufficient," and the electricity supply is reported to be provided 24 hours a day, without interruption. The electricity is procured from Turkey, and the tariffs are as follows:

- Residential: 12 cent/kWh
- Industrial: 14 cent/kWh

Details regarding the number of transformers and internal grid capacity are not clear. These subjects should be technically re-evaluated in the later feasibility phase, along with load forecasts. The design of a separate/dedicated distribution network and potential backup supply lines for the OIZ will be critical, especially for attracting energy-intensive sectors.

2.2.4.2 Water Supply

It is stated that the water quality and quantity across Idlib are adequate for both drinking water and utility water. However, the existing water network is old and has been severely damaged due to the war, which has significantly reduced the system's reliability. Analyses conducted on samples taken approximately 1 km away from the Free Trade Zone indicate that the water complies with international standards. A water reservoir with a current capacity of $60 m³ is located in the OIZ area. A bill-based water tariff based on consumption is currently not implemented in the region. It is stated that water prices vary from region to region, but the general level is described as “not high.”

In this context, it is understood that the water demand of the OIZ can be physically met; however, this supply should not rely on the existing network but rather on a new transmission and distribution system based on groundwater resources. For industrial users, issues such as drilling new wells, designing the necessary treatment processes, and establishing assurance mechanisms for continuous flow rate (debit) and water quality necessitate a separate and detailed engineering feasibility study.

2.2.4.3 Wastewater, Stormwater, and Natural Gas

There is no sewage infrastructure in the OIZ area. Although some surrounding villages have wastewater infrastructure, it is clear that a central wastewater treatment plant will need to be established for the region. During the discussion, it was stated that the establishment of a central wastewater facility may be legally mandated.

- The design of the OIZ in the region must be structured to include a central wastewater treatment plant dependent on the Ministry of Energy or the authorized institution.
- Stormwater collection and drainage infrastructure is also non-existent and must be considered in the new planning.
- Natural gas infrastructure is not available. An investment to bring natural gas to the region must be planned in the medium term, especially to enable the operation of energy-intensive and natural gas-dependent sectors.

2.2.5 Social, Institutional, and Support Infrastructure

2.2.5.1 Banking and Financial Services

It is reported that banks operating in the former regime-held areas have opened branches in Idlib; for instance, Sham Bank has a branch in Idlib, which supports transactions in TRY, USD, and SWIFT. It was stated that the bank may also open a branch in the area if the Idlib OIZ project is implemented.

2.2.5.2 Education and Health

Ebla Private University, which operates in Saraqib, hosts faculties of pharmacy, engineering, and economics/administrative sciences. This constitutes an important advantage for the OIZ, as it may facilitate the supply of engineering and administrative staff as well as qualified R&D/technical personnel. In addition, Idlib University and Aleppo University are other higher education institutions located in proximity to the region.

On the health side, the nearest health center is located in Saraqib. It is noted that there are three public and four private hospitals in the broader area (Saraqib and/or Idlib), with the main hospital situated in Idlib.

2.2.5.3 Accommodation, Commercial, and Other Services

- It is reported that there are restaurants and catering companies in Saraqib and Ariha, and that highway rest facilities have been renovated; there is also a restaurant located directly across from the planned OIZ area.
- Saraqib is said to have a shopping mall.
- The four-star Cartton Hotel in Idlib is reportedly undergoing renovation.

The presence of a civil defense unit (similar to Turkish AFAD) in Saraqib, along with additional centers in Sarmin, Idlib, and Ariha, is considered a positive element in terms of response capacity for potential fires and disasters. However, it will still be necessary to design a dedicated fire-suppression infrastructure and hydrant system within the OIZ from scratch.

2.2.5.4 Telecommunications and Internet

It is reported that Saraqib has basic telecommunications infrastructure, but internet quality is very poor; DSL/ADSL connections exist, yet capacity is insufficient. The information that fiber infrastructure works have progressed as far as Saraqib indicates significant medium-term improvement potential.

Regarding mobile networks, SyriaCell and MTN lines are operational, while Turkcell reportedly has partial coverage. In this context:

- In the short term, establishing a robust fixed-internet and data infrastructure within the OIZ is of critical importance.
- Plans to improve the region's telephone infrastructure are underway; this is considered a positive starting point for strengthening the communications infrastructure required by the OIZ in the future.

2.2.5.5 Labor Market and Wages

The wage levels mentioned during the meeting indicate that the region holds a competitive position in terms of labor costs:

- Engineer: 800–1000 USD/month (Idlib)
- Technician: 500–800 USD/month
- Semi-skilled worker: 400–500 USD/month
- Unskilled laborer: 200 USD/month

These levels represent a significant cost advantage, particularly for labor-intensive sectors and medium-technology manufacturing industries. However, the lack of clear information regarding social security regulations, labor taxes, insurance rates, and official working hours creates uncertainty for investment decisions. It was noted that all these topics should be reviewed jointly with regional authorities and Kuteybe Ahmed Bedevi.

2.2.5.6 Tax, Customs, and Foreign Trade Regime: Areas of Uncertainty

It was noted that many critical issues regarding the tax framework (income tax, corporate tax, VAT), customs duties and other indirect taxes, the scope of free trade agreements, and the functioning of

the customs administration should be examined in detail at later stages together with Kuteybe Ahmed Bedevi

3 Land and Climate Conditions of the Region

3.1 Ground Conditions

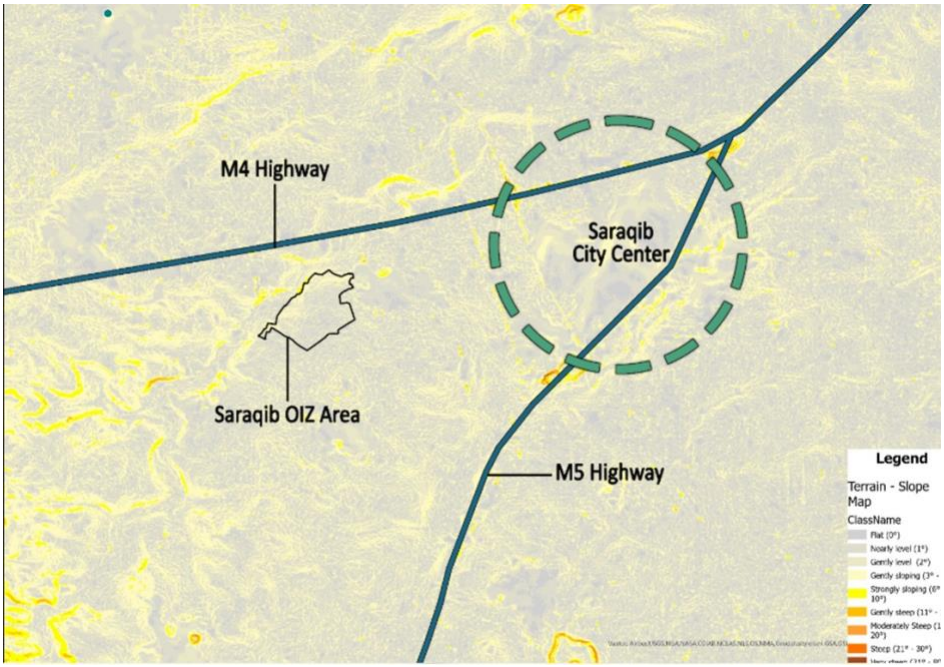
The Saraqib area is located on the Aleppo–Idlib limestone plateau in northwestern Syria, where the topography is predominantly flat with gentle undulations. Various sources report the region's elevation as between 349 and 371 meters above sea level, confirming its character as a low-gradient, almost level plateau (FAO, 2001; GEGMR, 2010). The approximately 1,000,000 m² state-owned land designated as the pilot OIZ area reflects this general topographic structure; the slope is negligible, offering a significant advantage for industrial parcel layout and site planning.

The geological foundation of the region consists of limestone–dolomite–based karst formations extending across western Syria. Official maps of the Syrian Geological Survey indicate that the Idlib plateau, including Saraqib, lies on extensive Upper Cretaceous–Eocene limestone units (GEGMR, 2010). Similar formations have been documented in field studies conducted in nearby historical settlements (particularly the "Dead Cities/Northern Limestone Massif"), characterized by exposed hard rock outcrops, shallow soil pockets, and broad rocky surfaces (De Giorgi, 2016; Millon, 2019).

Due to this karstic plateau structure, soil depth across the area is limited; the surface material consists predominantly of stony–rocky soils, with pockets of thin red terra rossa–type soils occurring in certain areas (FAO, 2001; Wilkinson et al., 2010). Field observations also confirm that the bedrock lies very close to the surface in some sections. While these hard ground conditions generally indicate high bearing capacity, they may require the use of specialized equipment such as breakers, rock drills, or controlled blasting for infrastructure excavation. Consequently, excavation and foundation construction costs may be higher compared with soft soil conditions. Detailed geotechnical drilling and laboratory testing are essential for final engineering decisions.

Overall the geomorphological location of the Idlib OIZ pilot area offers a stable plateau surface in an engineering sense, unobstructed topography, and land suitable for large-scale parcelation; however, due to the rocky ground structure, it necessitates careful planning of infrastructure excavation costs.

Figure 5 Slope Map of the Idlib Pilot OIZ Area



Source: USGS, TEPAV visualizations

In terms of water permeability, karst limestone terrains generally have medium to high infiltration capacity; rainfall can rapidly infiltrate underground through cracks and voids within the rock mass (Williams, 2008; Jukić & Denić-Jukić, 2021). Studies on limestone areas in the Mediterranean and semi-arid climate zones show that a significant portion of precipitation passes underground via the epikarst zone on karstic surfaces covered with a thin soil layer. However, rapid surface runoff and temporary ponding can occur, especially when the infiltration capacity is exceeded during short, intense rainfall events (Li et al., 2011).

Considering this general karst behavior, the fractured limestone ground at Saraqib is also expected to transmit some of the precipitation underground. Nevertheless, the combination of shallow and stony soil cover with the flat plateau surface means that, during heavy rainfall, a significant portion of the water may become surface runoff, increasing the risk of ponding in specific locations if drainage lines are not designed. Therefore, the OIZ planning process requires the design of stormwater collection, delay, and controlled discharge systems that account for rainfall–runoff behavior (Li et al., 2011; Williams, 2008).

Hydrogeological studies conducted for Northwest Syria and neighboring basins reveal that the carbonate formations constitute significant karst aquifers, which play a critical role in the regional groundwater budget even under semi-arid conditions (Burdon, 1965; Jaafar et al., 2016). These studies emphasize that groundwater recharge in karst systems shows periodic fluctuation based on rainfall, and excessive extraction can lead to problems such as groundwater level decline and reduced source productivity (Baba, 2021). The two existing water wells on the Saraqib site indicate that groundwater access is possible, presenting a potential supplementary water source for the OIZ. However, the use of this resource must be planned within sustainable extraction limits, considering the regional water budget and potential conflicts with other users (agriculture, settlements, etc.) (Baba, 2021; Jaafar et al., 2016).

In terms of bearing capacity, soils resting on sound limestone bedrock are generally defined in geotechnical literature as foundation layers with high bearing capacity and low compressibility (USACE,

1997; Northmore, 1991). Engineering guidelines for rock foundations state that allowable bearing stresses in fresh or slightly weathered rock masses can often reach the order of hundreds of kPa, and under favorable conditions, 1000–2000 kPa; the main limiting factors are the degree of weathering, discontinuities, fractures, and potential void zones (USACE, 1997; Farid, 2012). Field and laboratory studies on limestone formations also show that shallow foundations can operate with relatively small settlements and that the risk of differential settlement can be limited if karstic voids are managed using methods such as grouting (Farid, 2012). These general findings suggest that the rocky ground in the Idlib OIZ area has the potential to provide a high-bearing-capacity foundation medium for heavy factory buildings, machine foundations, and storage structures, provided this is confirmed by detailed geotechnical drilling and laboratory testing.

Regarding seismic behavior, seismology and geotechnical literature show that strong ground motions are often intensified by "ground amplification" in thick soft soil layers, recording higher accelerations and spectral amplitudes in soft soils compared to rock reference stations (Bard, 1999; Borcherdt, 2002). Since soil cover is limited and the rock surface is expected to be close to the surface in the Idlib OIZ area, a more limited ground amplification and more stable seismic performance can be expected for appropriately earthquake-designed structures compared to soft-soil areas. However, potential voids and weak zones developed within the karstic limestone must be identified through special studies for both bearing capacity and seismic behavior, and managed with engineering measures such as grouting, filling, or foundation improvement where necessary (Farid, 2012; USACE, 1997).

3.2 Climate Conditions

Saraqib and its surroundings experience a version of the Mediterranean climate with a continental influence. According to climate classification, the region falls under the "hot-summer Mediterranean climate" (Köppen Csa) type (Mindat.org, n.d.). This climate is characterized by hot, dry summers and mild, rainy winters. The annual climatic parameters and factors that may affect OIZ activities can be summarized as follows:

- **Temperatures:** The annual average temperature in Saraqib is approximately 18°C. Summer months are quite hot; in July and August, average daytime temperatures can reach 35–38°C. The daily average temperature (day and night) during summer ranges from 27–29°C. In winter, the average daytime temperature is around 8–11°C, while nighttime lows generally hover near 0°C, although rare frost events reaching –5°C to –6°C can occur. January is the coldest month of the year, with daytime temperatures around 10–12°C and nighttime temperatures ranging from a few degrees above zero to light frost. Spring and autumn transitions are relatively short, and rapid temperature fluctuations can occur. Overall, the region has a climate in which snowfall is rare, and temperature extremes are moderate (mild in winter compared to desert climates and not reaching Saharan temperatures in summer due to humidity) (nomadseason.com, n.d.).
- **Precipitation Regime:** The total annual precipitation averages approximately 333 mm. Precipitation exhibits strong seasonal variation; more than 80% falls in late autumn, winter, and early spring. The rainiest months are December, January, and February, with monthly averages of 50–70 mm. Precipitation decreases in late spring (April–May), with the May average dropping to around 14 mm. Summer months are very dry, with negligible rainfall in July and August (0–1 mm). Precipitation resumes in autumn starting in October (October ~10 mm, November ~38 mm). This pattern of intense winter rainfall and interrupted summer drought poses a risk of water accumulation in open areas during winter (if infrastructure is insufficient) and potential water scarcity or drought in summer for the OIZ. Additionally, short-term operational interruptions may occur during rainy winter days, while summer may require dust control and irrigation measures (nomadseason.com, n.d.).

There is a transformer station located approximately 1 km from the Idlib OIZ site, and it is stated that electricity will be supplied from this point. The capacity of the external grid is described as “sufficient,” and electricity supply is reportedly available 24 hours a day without interruption. Electricity is imported from Turkey, with a residential tariff of 12 cents/kWh and an industrial tariff of 14 cents/kWh. However, technical details regarding the number of transformers and the capacity of the internal grid are unclear; these issues need to be revisited and examined in detail together with load forecasts at a later feasibility stage.

The design of a separate/dedicated distribution network for the OIZ, along with possible backup feeder lines, is of critical importance, particularly for attracting energy-intensive sectors. Field observations indicate that there is available land within or adjacent to the OIZ area that would be suitable for the installation of a ground-mounted solar power plant (SPP). In this context, taking into account the region’s solar potential, the inclusion of an OIZ-integrated SPP as an alternative scenario in the feasibility study should be considered; although it would require additional investment at the initial stage, it has the potential to reduce unit energy costs and enhance security of supply in the medium to long term.

3.3 Natural Disaster Risk

The two most critical factors in the natural disaster risk assessment for the Saraqib region are earthquake hazard and flood (inundation) risk. The region's disaster risk profile is as follows:

Earthquake Risk: Similar to the rest of Northwest Syria, Saraqib is located under the influence of active tectonic belts. The region is situated close to active fault systems, such as the Dead Sea Fault Zone to the south and the East Anatolian Fault to the north. Historical records indicate that destructive earthquakes have occurred in the vicinity (e.g., the 1138 Aleppo earthquake and the 1822 Aleppo/Antioch earthquake are among the largest). More recently, the magnitude 7.8 earthquake on February 6, 2023, severely affected Idlib province, to which Saraqib belongs, causing the collapse of numerous buildings, damage to infrastructure, and loss of life across Idlib.

Seismological data shows that at least a few M6+ earthquakes, including the February 6, 2023 event, have occurred in and around Saraqib since 1900, with small-to-moderate earthquakes frequently felt. However, expert assessments indicate that the selected area for the OIZ in Saraqib carries a relatively lower seismic risk compared to some other settlements and alternative industrial locations in Northwest Syria, based on its position relative to fault segments and its local ground characteristics.

Due to this high but relatively advantageous earthquake hazard level, it is vitally important that all structures built in the OIZ area are designed in full compliance with current earthquake regulations. Since the ground is rocky, the amplification effect of seismic waves is lower compared to soft alluvial soil. Nevertheless, sufficient earthquake resistance (e.g., strong column-beam connections, shear walls in reinforced concrete frames, and seismic isolation technologies where necessary) must be incorporated into the structural design, as even hard ground can experience significant accelerations from near-fault shaking. While existing civil defense units and volunteer search and rescue organizations in the region offer initial response capability after a potential earthquake, emergency plans (backup generators, supplementary water tanks, first aid, and debris removal equipment, etc.) must be prepared within the OIZ against the possibility of interruptions to roads, energy, and water infrastructure following a major earthquake.

Flood (Inundation) Risk: The flood risk in Saraqib is more localized and manageable compared to the earthquake risk. The risk of river flooding is low as the region is far from major riverbeds; major rivers like the Euphrates or the Orontes (Asi) are not in the vicinity, so classic river floods do not pose a threat to Saraqib. However, the flat terrain and the surface's limited permeability can lead to surface water

accumulation and flash flood risk during heavy downpours. Temporary inundations may occur, especially in winter months when high amounts of rainfall fall in a short period and natural drainage paths are insufficient. Recent years have seen heavy rainfall in the Idlib region causing floods in settlements and camps with weak infrastructure. For instance, downpours in Northwest Idlib in October 2022 led to flooding in tent cities (Syrian Observatory for Human Rights, syriahr.com, n.d.). The Idlib OIZ land currently lacks a stormwater drainage system, so stormwater drainage must be designed in the new planning to ensure controlled water management during the rainy season. Given the rocky ground structure, surface runoff water must be collected and discharged at specific points; otherwise, inundation can occur on internal roads, open storage areas, or in structures with basements. Moreover, sudden rainfall after a prolonged drought contributes more highly to surface runoff. Therefore, flood risk management planning for the OIZ is necessary considering potential increases in extreme rainfall. In conclusion, while Saraqib does not face a large-scale flood risk, there is a risk of localized inundations caused by flash rainfall, which can be mitigated with appropriate engineering measures. Furthermore, secondary risks such as dam failure are not a concern, as there are no dams or large water structures near the site.

3.4 Conclusion of the Assessment

The Saraqib area offers favorable ground and environmental conditions for an OIZ investment. Owing to its flat and solid terrain, site preparation works are expected to be relatively easy and low-cost; the rocky topography provides a high load-bearing foundation that enables the construction of large industrial facilities. The region's strategic location—close to the junction of the M4 and M5 highways—offers significant logistical advantages. Climatically, the area benefits from a long and sunny construction/operation season; mild winters allow construction and production activities to continue throughout the year. Snowfall and frost are rare, minimizing cold-weather interruptions, while the high level of annual sunshine makes the region attractive for investments such as solar-based electricity generation. Additionally, low air humidity reduces corrosion and rusting on physical capital, extending the service life of facility equipment. The existing civil defense and firefighting infrastructure in the area also provides prompt emergency response capacity for potential fires or accidents near the OIZ.

However, a number of structural limitations and risk factors must be considered for establishing an OIZ in Saraqib. First, although northwestern Syria as a whole faces high seismic hazard, the proposed OIZ site in Saraqib has a relatively lower seismic risk profile compared to some alternative settlement and industrial locations in the region. Nevertheless, industrial structures still require resilient design solutions, comprehensive geotechnical studies, reinforced structural systems, and emergency scenarios within a broader disaster management framework. These requirements entail additional engineering diligence at the design stage and may increase costs. Accordingly, strict building inspections, full compliance with up-to-date seismic codes, and the establishment of an effective insurance/crisis-management mechanism remain important for investor confidence.

Second, the region's climatic characteristics stand out as a critical environmental factor for OIZ planning. Extremely high summer temperatures may require adjustments to working hours and bring additional investment needs such as shading, cooling, and ventilation systems. The dry summer season and intensive agricultural water use increase water-supply security risks for the OIZ, especially given the area's heavy reliance on groundwater. Therefore, investments such as rainwater harvesting, greywater recycling, and alternative water sources should be incorporated into the feasibility assessment. Dusty air conditions and occasional dust storms pose potential health risks to workers and increase maintenance needs—such as equipment wear and filter blockages—making enclosed storage areas, proper filtration systems, and personal protective equipment more important. From an infrastructure perspective, the current lack of sewage, stormwater drainage, and natural gas networks means these systems must be constructed from scratch, increasing initial investment costs. While the

ground is solid, the rocky subsurface complicates excavation for water, sewage, and electricity lines, requiring heavy machinery, longer construction periods, and higher unit costs. The impermeable surface rock layer can increase surface runoff during heavy rains, creating temporary water accumulation and flood risks; thus, a strong stormwater drainage infrastructure and surface-water management plan are necessary for OIZ design. Lastly, industrial wastewater and other environmental impacts that will emerge once the OIZ becomes operational will require additional treatment capacity and environmental management plans due to regional ecological sensitivities.

In light of the technical data, the Saraqib area offers significant opportunities for OIZ development due to its ground quality, climatic characteristics, and strategic location. With properly planned infrastructure, industrial facilities can be safely constructed and operated on this flat and solid terrain. When combined with appropriate engineering solutions (e.g., cooling systems, dust control measures, water-management strategies), the climatic conditions will support efficient year-round production. Although seismic hazard remains an important regional factor, Saraqib's relatively lower seismic risk profile and the area's infrastructure needs constitute the main project components requiring careful management. If these limitations are properly addressed during design and implementation, an OIZ established in Saraqib is expected to significantly contribute to regional economic revitalization and post-conflict recovery.

4 Preliminary Design for Idlib OIZ

In Figure 6, the current satellite image of the project area located southwest of the Saraqib settlement, along with only the OIZ boundary line, is shown on the left. On the right, the proposed layout of the Idlib OIZ within the same boundaries is presented schematically, including the industrial blocks and internal road network.

Figure 6 Idlib OIZ Area and Concept Design

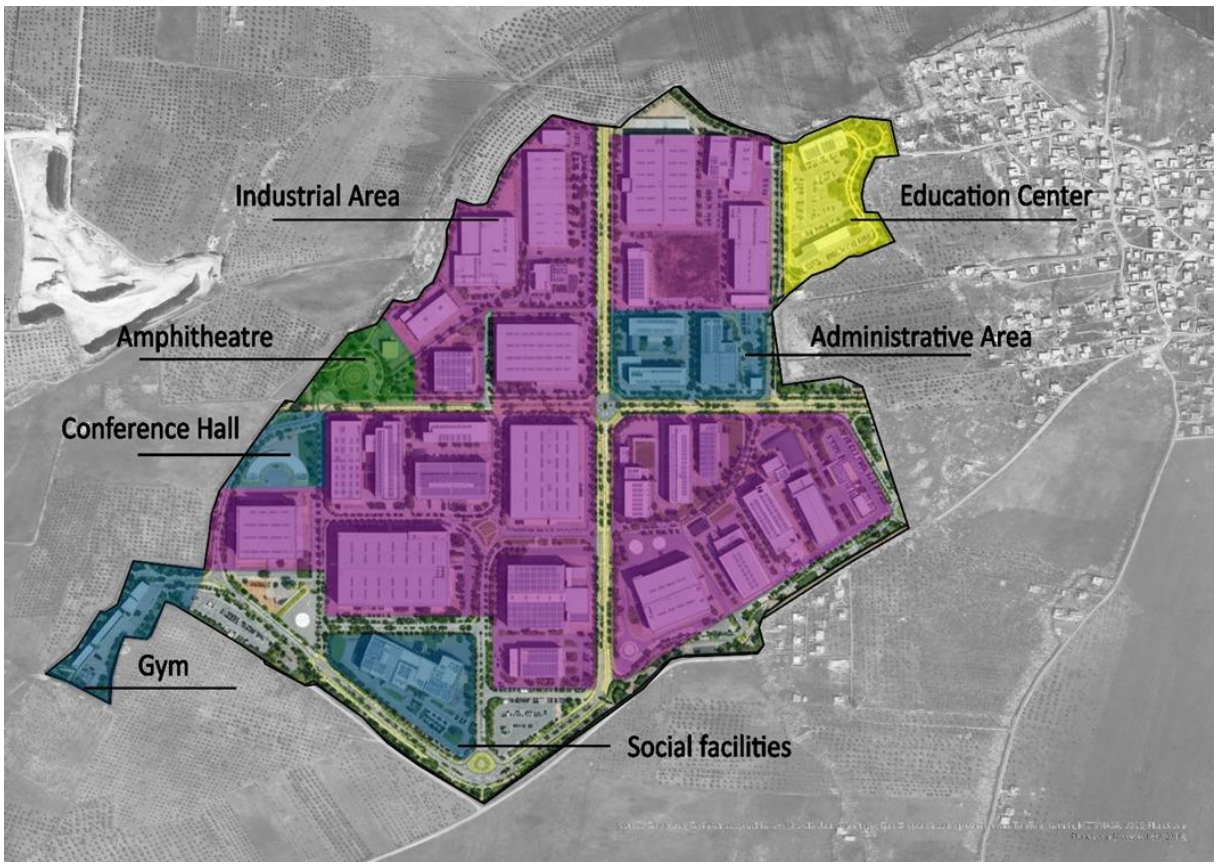
Source: TEPAV Field Survey, TEPAV visualizations

OIZs are not limited to production parcels; they also include various functional areas for administrative, social, and educational purposes. Figure 7 shows the main planned use zones within the Idlib OIZ and their spatial distribution:

- **Industrial Area (purple):** The main production zone where manufacturing facilities, warehouses, and industrial plots are concentrated.
- **Administrative Area (blue / right-center):** The section that includes the OIZ administration building, administrative offices, and investor service units.

- **Training Center (yellow):** The area allocated for the vocational and technical training center, workshops, and training units aimed at developing the workforce within the OIZ.
- **Commercial Center and Social Facilities Area (blue / bottom section):** Cafés, restaurants, small commercial units, bank/ATM services, and other daily-need social facilities.
- **Conference Hall (blue / left-center):** The zone planned for a closed hall designated for meetings, conferences, workshops, and promotional events.
- **Place of Worship (green):** The area designated for a religious facility to meet the worship needs of employees.
- **Sports Hall (blue / bottom-right):** The section containing the indoor sports hall and associated recreation areas for OIZ employees.
- **Wastewater Pumping Station (blue / bottom-left):** The area for technical facilities responsible for collecting and conveying the OIZ's wastewater.

Figure 7 Functional Zoning and Land Use in the Preliminary Design of the Idlib OIZ



In Figure 8, the industrial buildings lined along both sides of the main road axis proposed for the Idlib OIZ, together with the illuminated wide carriageway, junctions, pedestrian sidewalks, and landscaped medians, are shown in a nighttime view.

Figure 8 Night View of the Idlib OIZ

5 Conclusion

The Pre-Feasibility Study for the Idlib Organized Industrial Zone (OIZ) was prepared to evaluate the feasibility of applying an OIZ-based approach in post-conflict economic recovery in Syria through a pilot example. Throughout the study, the institutional framework of the OIZ model, based on Turkey's experience, was first presented. The profile of Syrian-partnered companies operating in Turkey and their investment intentions toward Syria were analyzed. This was followed by detailed field observations, technical assessments, and investment calculations for the Saraqib region.

The findings show that Saraqib has significant potential for OIZ investment in terms of geological conditions, climate, logistics accessibility, and existing infrastructure. Its proximity to the M4–M5 highway corridors, the Port of Latakia, Aleppo Airport, and border crossings with Turkey places the area in a favorable position for both the domestic Syrian market and regional trade flows. The flat, rocky plateau provides high load-bearing capacity for industrial structures and facilitates parceling and internal circulation. The mostly sunny and work-friendly climate allows construction and production activities to continue uninterrupted for most of the year. While seismic hazard remains significant at the regional level, the proposed OIZ site has a relatively lower seismic risk profile compared to some surrounding settlements, and safe construction is considered feasible with appropriate engineering solutions.

Field surveys, corporate interviews, and technical reviews indicate that energy and water supply in Saraqib can be secured through specific investments. The presence of a substation and transmission lines ensures 24-hour electricity supply, and wells established for agricultural research, along with regional hydrogeological studies, show access to groundwater is possible. However, the absence of wastewater, stormwater drainage, and natural gas infrastructure at this stage requires planning these systems from scratch within the OIZ project. In the preliminary design, functions such as administrative areas, training centers, commercial centers, social facilities, places of worship, sports halls, and

wastewater pumping stations are integrated under a single settlement layout together with industrial parcels. This approach aims to make Idlib OIZ not only production-focused but also a livable working environment for employees and investors.

As highlighted in the report's introduction, a large-scale survey of Syrian-partnered companies operating in Turkey shows that more than half plan to establish operations in Syria in the medium term, but this decision depends on the availability of safe and fully serviced industrial areas. The proposed Idlib OIZ can serve as a bridge both to the production ecosystem on the Turkish side of the border and to potential domestic investments in Syria. The planned model could facilitate the expansion of Syrian capital operating in Turkey into Syria.

At the same time, the pre-feasibility findings indicate that the project's success depends on some critical conditions. Legal and institutional frameworks—including tax, customs, and investment regulations—must be clearly defined, predictable, and implementable for investors. Key aspects such as OIZ management models, ownership and operational rights, licensing and permitting processes, coordination with customs authorities, and dispute resolution mechanisms need to be detailed together with relevant Syrian institutions. External risks, including security conditions, macroeconomic instability, and sanctions, should also be considered. Project financing should be structured flexibly and from multiple sources (local public funds, international funds, development finance institutions, and private sector) to mitigate these risks.

In conclusion, this pre-feasibility study shows that Saraqib has significant potential for OIZ investment in the context of post-war reconstruction. Technical and economic analyses suggest that with proper design, robust infrastructure, a clear institutional framework, and adequate security and governance measures, Idlib OIZ can be successfully implemented and support regional economic recovery. A successfully implemented OIZ model in Saraqib would not only stimulate production and employment in Idlib and surrounding areas but also serve as an example for similar industrial clusters in other regions of Syria. Therefore, based on the findings presented in the report, the next recommended step is to proceed to a detailed feasibility phase, including engineering designs, financing plans, and legal–institutional frameworks, to advance the Idlib OIZ project to the next level.

6 Annex: TEPAV–Idlib OIZ Structured Question Form

General Location

- What is the location of the area (environmental conditions, neighbourhood characteristics)?
- Are the boundaries clearly defined and enclosed?
- What are the ground conditions of the land? (Geology, slope, elevation, etc.)
- Which is the nearest city centre and what is its distance?
- Which is the nearest district centre and what is its distance?
- Which is the nearest urban centre and what is its distance?
- Which is the nearest university and what is its distance?
- Which are the nearest main and relevant industrial centres, and what are their distances?

Ownership Information

- Who owns the land?
- Who owns the infrastructure?
- Who owns the superstructure?
- Is the transfer of ownership possible?
- What is the market price of the land? (m^2 / USD)
- What is the monthly land rental price? (m^2 / USD)
- What is the monthly building rental price? (m^2 / USD)
- What is the total area? (m^2)
- How many buildings are there?
- What is the total floor area of the buildings? (m^2)

Transport Facilities

- Are there access roads? What are their distance (km) and quality?
- Is there a port? What are its distance (km) and quality?
- Is there an airport? What are its distance (km) and quality?
- Is there an asphalt road? What are its distance (km) and quality?
- Are there international transport companies? What is their quality?
- Which airline companies operate and what is the frequency of flights?
- Is there a railway station? What are its distance (km) and quality?

Road Infrastructure

- What is the structure of the roads? (asphalt / concrete / stabilized / dirt)
- What is the road width?
- Are there parking areas and a truck parking area? What is their capacity?
- What is the total length of the road network? (km)

Electricity Infrastructure

- What is the condition of the grid (infrastructure and superstructure)?
- Is the grid independent or part of the local network?
- What is the distance to the transformer station?
- What is the capacity of the transformer station? (MW)
- What are the structure and capacity of the external grid?
- What are the characteristics and capacity of the source of supply?
- What is the electricity price? (USD/kWh)
- What are the structure and capacity of the internal grid?
- How many transformers are there and what are their capacities?
- From where is the electricity supplied?
- How is the continuity of electricity supply (frequency of outages)?

Water Supply

- Are drinking water and utility water supplied separately?
- What are the source and quantity of drinking water?
- What are the source and quantity of utility water?
- What are the structure of the water network and the daily leakage rate?
- How is the continuity of the water source?
- What are the laboratory analysis results for drinking water?
- What are the laboratory analysis results for utility water?
- What is the price of drinking water? (USD/m^3)
- What is the price of utility water? (USD/m^3)
- What is the total length of the drinking water network? (km)
- What is the total length of the utility water network? (km)

- Is there a chlorination plant?
- Is there a water reservoir? If yes, what is its capacity? (m^3)

Wastewater Infrastructure

- What is the quality of the wastewater network?
- What is the capacity of the wastewater network? (m^3/h)
- What is the length of the network? (km)
- Is it connected to industrial facilities?
- Do firms have pre-treatment plants?
- What is the quality of the wastewater?
- What is the final discharge point?
- How many discharge points are there?
- What is the legal framework regarding this issue?
- How does the wastewater collection and treatment system operate?

Wastewater Treatment Plant

- Is there a wastewater treatment plant?
- What is the quality of the plant?
- What is the capacity of the plant?
- What is the discharge point?
- What is the sludge disposal method?
- What are the laboratory reports for the incoming water?
- What are the laboratory reports for the outgoing (treated) water?
- If there is no plant, is there an available area for its construction?
- What is the legal framework regarding discharge standards?

Natural Gas

- Is natural gas available in the area?
- Is the distribution network independent?
- What is the available volume of natural gas? Is it sufficient?
- What is the condition of the distribution network?
- Does each plot have access to natural gas?

- Who operates/manages the natural gas network?
- What is the price of natural gas?
- How is the continuity of natural gas supply?

Stormwater (Rainwater)

- Is there a stormwater (rainwater) drainage network?
- What is the annual precipitation level? (kg/m^2)
- What are the quality and adequacy of the network?
- What is the discharge point?
- Does each plot have access to this network?

Social and Support Infrastructure

- Is there a management/administration centre? Is it adequate?
- Is there a bank or a bank building on site?
- What is the distance to the nearest bank?
- Are there restaurants or catering companies in the vicinity? What is the distance?
- Is there a health centre? What are its distance and quality?
- Is there a first-aid/ambulance facility? What is the distance?
- Is there a fire brigade? What is the distance?
- Are there fire hydrants on the plots?
- Is there a shopping centre? What is the distance?
- Is there a hotel? How many stars does it have and what is the distance?
- Is there a place of worship? (mosque, church) What is the distance?
- Is there a sports facility?

Telecommunications Infrastructure

- Is there a telecommunications infrastructure?
- What is the quality of the network? (underground, overhead, fibre, copper)
- Is there an ISDN network?
- Is there a telephone exchange? What is the distance?
- What are the capacity and expansion possibilities of the telephone system?

- Is there internet access? Who is the service provider, what is the capacity, and what is the cost?
- Is DSL/ADSL available? What is the cost?
- Does the distribution network reach all plots?
- Is there a GSM network? Is its capacity sufficient?
- What are the local and international call charges?

Climatic Conditions

- What are the monthly temperature values?
- What is the monthly average precipitation?
- Is there a wind feasibility study?

Zoning and Construction

- Is there a zoning/development plan?
- What are the criteria for amending the zoning plan?
- What is the plot coverage ratio? (How much construction is allowed per 100 m² of land?)
- What is the floor area ratio? (Total construction area allowed per 100 m² of land?)
- What is the maximum building height?
- Which authority issues the construction permit? How many days does it take? What is the fee?
- Which authority issues the operating licence? How many days does it take? What is the fee?
- How many documents are required for the operating licence? How fast is the process?
- What are the conditions for establishing and registering a business?

Labour Force and Wages

- What is the supply of engineers? What are their wages?
- What is the supply of technicians? What are their wages?
- What is the supply of semi-skilled workers? What are their wages?
- What is the supply of unskilled workers? What are their wages?
- What is the monthly minimum wage?
- What are the weekly working hours?
- How many public holiday days are there per year?
- What are the labour tax and social security contribution rates?

Social Security Legislation

- What is the social security legislation?
- What is the impact of the social security law on wages?

Tax Legislation

- What is the tax legislation?
- What are the income tax, corporate tax, and VAT rates?
- Is there a customs duty? What are the rates?
- What other taxes exist and what are their rates?
- How effective is the tax administration in tax collection?

Foreign Trade Opportunities

- Are there free trade agreements, and what do they cover?
- What is the scope of the free trade agreements? (duration and sectors)
- How close are the border crossing points? What are the customs processing time and capacity?
- What is the quality of the logistics companies?
- What are the customs regulations and how effective is the customs administration?

Other Issues

- Is there free movement of goods and people within the country?
- What are the conditions for employing foreign workers?
- What is the fuel cost? (diesel / gasoline)
- How much are apartment rental prices?
- How much are vehicle rental fees?

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