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An overview of the wood products sector in Iran: 2007-2022

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ABSTRACT

In this paper, we assess the development of the Iranian wood products industry over the past two decades. The sector is an important component of Iran's economy with the potential for growth across different product markets. We discuss past, current, and future raw materials, production, trade, and consumption. Overall, the industry is fragmented and faces a number of challenges that hinder success in domestic and export markets, including lack of access to quality raw materials, problems with production quality control, and access to markets. Evaluation of trends and market patterns shows that the Iranian wood industry sector is developing continuously and has the potential for further growth. Considering the potential domestic and international market and the Iranian wood industry's strengths, suggestions were provided to accelerate industry development, such as investments and efforts to facilitate wood raw material imports, establishment of new management methods and considering new technologies to upgrade the quality and quantity of production together with the profitability.

INTRODUCTION

References to the wood products industry in Iran can be traced as far back as 4200 B.C. in the writings of historians such as Herodotus, Xenophon, and Quinte Curce. In this period, native people of Iran used wood for wheels, carts, and agricultural tools. Later, in the Achaemenid dynasty, Xenophon describes wood used for battle weapons, buildings, ships, and bridges. (Tutunjanian 2005). Modern industrial use of wood in Iran emerged with the establishment of sawmills and match factories in the early 1900s and the manufacturing of plywood, fiberboard, particleboard, and furniture in the 1950s (Parsapajouh 1988). This paper gives an overview of the current forest sector in Iran with an emphasis on manufacturing capabilities and challenges.

Although Iran has a forest products manufacturing industry, and government statistics are generated annually, previous literature has not provided a cohesive perspective of the industry by product sector, with the exception of an article published almost two decades ago (Arian et al. 2007). Similar studies from other countries were found in the literature. For example, Aksu et al. (2011) analyzed the structure of Turkey's wood products industry and suggested ways to improve the country's competitive position in global markets. A study in India evaluated the production, import and export of wood-based panels in the country over the past 24 years (from publication date), including a discussion of market trends (Upadhyay et al. 2016), and Ototo and Vlosky (2018) provided a comprehensive overview of the forest sector in Kenya. Same authors did another study on deconstruction innovation in the wood furniture industry in Kenya (Ototo and Vlosky 2023). Hammett et al. (2001) studied forestry and forest products in China, giving an overview of the current and future situation of the forest products industry and market in this country.

This article draws from a variety of sources to develop a comprehensive view of the Iranian forest products industry and its changes from 2007 to 2022. We discuss the history of the forest industry in Iran as well as the country's forest resources and industry structure by major product category. Overall, the Iranian forest products industry is fragmented and faces a number of challenges that hinder success in domestic and export markets. The production and trade trends are evaluated for each product, including different types of wood-based panels and furniture and the patterns are extracted. The main challenges are discussed, and policy recommendations are given for future development of the industry.

DEMOGRAPHIC/ECONOMIC INDICATORS

During the past decade, Iran has been among the top 22 countries in the world in terms of population and gross domestic product (Table 1). Among nearly 190 countries, Iran has been in the middle ranks for per capita GDP, global competitiveness, global innovation, human development, comprehensive development, and digital adaptation. Conversely, the country is ranked on the lower end of the spectrum for other socio-economic indicators: high inflation and unemployment, low labor force participation rate for males, very low female labor force participation rate, low fertility rate, nominal economic freedom, and a low level of gender equity. It is significant and important to note that improvement in socio-economic conditions is a necessary precursor to improving the future of the nation’s overall economy (Bloom 2020).

Table 1. Iran’s international socio-economic position indicators (various years).

Indicator	Year	Rank (190 Countries)
Population (million)	2021	18
Labor force participation rate (percentage)	2020	174
Fertility rate (children per woman)	2021	101
Number of scientific articles	2018	16
GDP ($ U.S. billion dollars)	2017	18
GDP per capita ($ U.S. dollars)	2017	69
Inflation (percentage)	2020	6
Unemployment (percentage)	2019	48
Business-Oriented Factors		
Economic freedom	2020	164
Gender opportunity/development	2018	148
Ease of doing business	2020	137
Open data availability	2019	117
Competitiveness	2019	99
Digital compatibility	2016	93
Human development	2020	70
Global innovation	2019	61

Sources: MEFA (2022)

FOREST RESOURCES OF IRAN

Iran has a total land area of 164.8 million hectares, of which 80 percent (131.5 million hectares) are designated as natural resources (Iran's Natural Resources and Watershed Management Organization 2023) (Figure 1). Natural resources are defined as any biological, mineral, or aesthetic asset afforded by nature without human intervention that can be used for some form of benefit, whether material or immaterial. Examples of natural resource assets include forests, surface water, groundwater, and fertile lands or the soil and minerals within them.

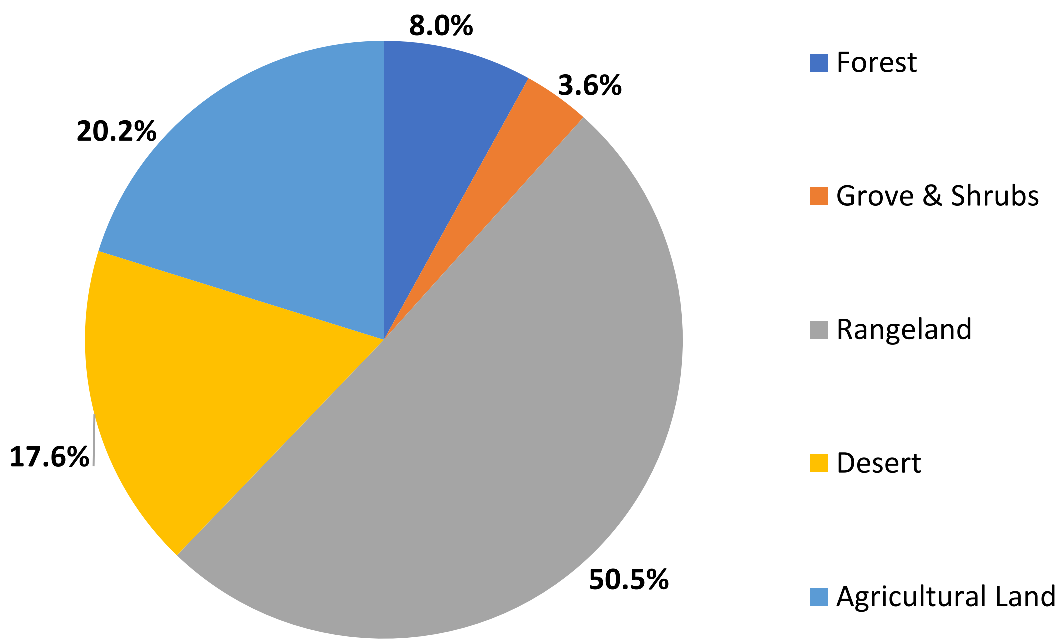


Figure 1. Iran land area by type (total=164.8 million hectares). Source: Iran Natural Resources and Watershed Management Organization (2023).

Forests comprise about 8% of the country's total area and are one of Iran's most important natural resources. They are dense in the north, with the most valuable forests found in Gilan, Mazandaran and Golestan provinces. Forests are divided into two groups: forests in the north and forests outside the north. In addition to the forests of the north, sparse and scattered forests are found in the west, southwest and northeast regions of the country.

In terms of climate, forests are designated by five zones according to the Iran Natural Resources and Watershed Management Organization (Figures 2 and 3). Zagros forests have the largest share with 4,680,983 hectares, and Arasbaran forests have the smallest share with 132,398 hectares of forest area compared to the total forests of Iran. This classification of Iranian forests is based on climate of each type, but the species of the trees and their productivity are different. The only productive and industrially harvestable forest of Iran is Hyrcanian forest in the north.

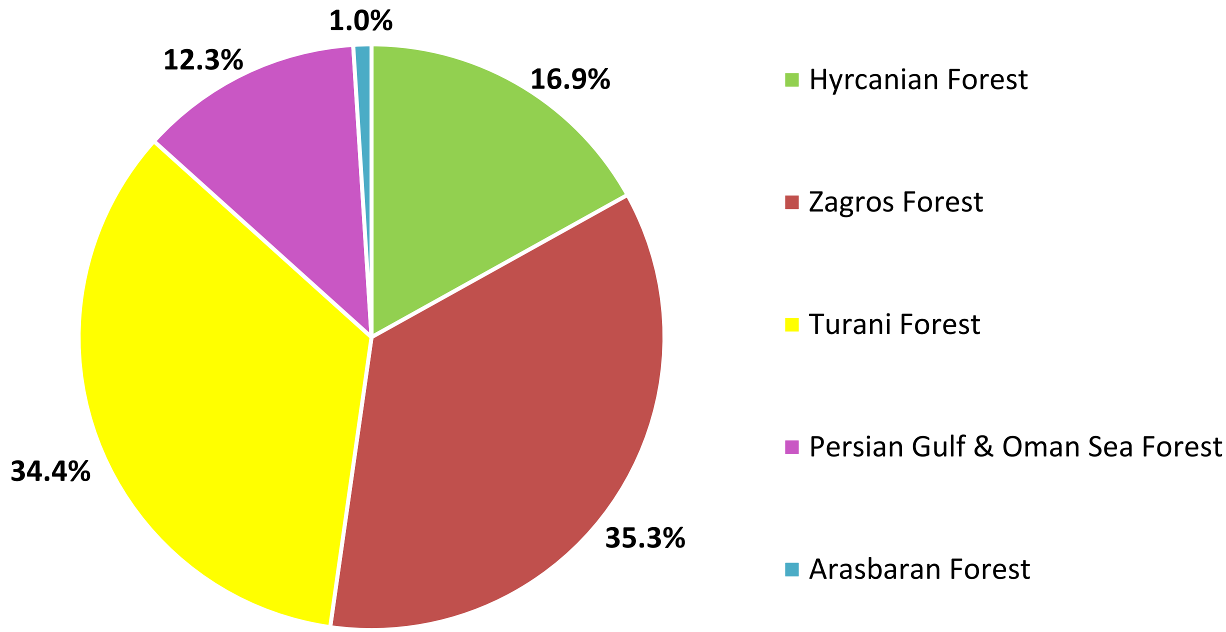


Figure 2. Iran forest types. Source: Iran Natural Resources and Watershed Management Organization (2023).

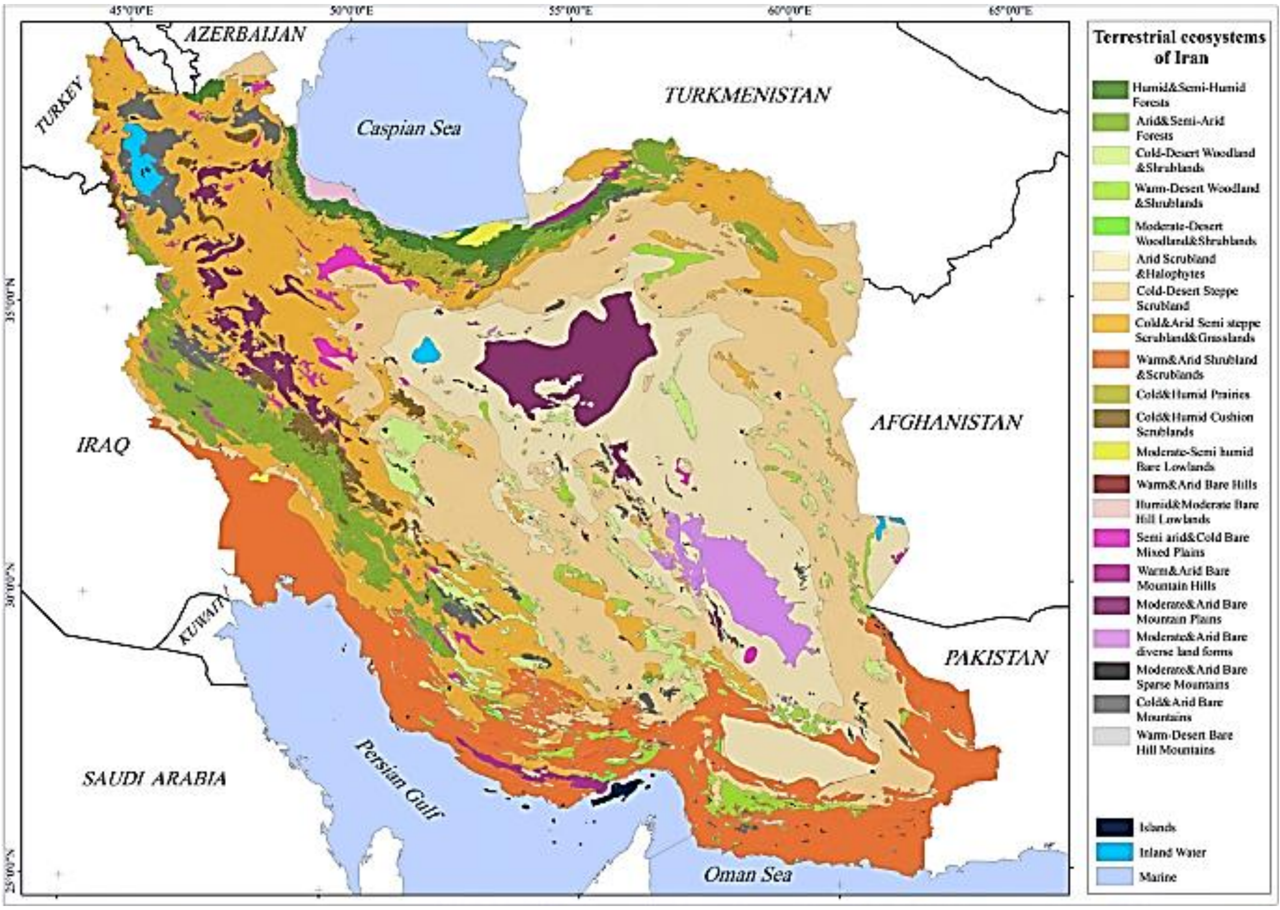


Figure 3. Iran ecosystems including forest types. Source: Iran Natural Resources and Watershed Management Organization (2023).

WOOD SUPPLY

Wood supply from natural forests was about 1.5 million cubic meters in 1995 and decreased to 0.87 million cubic meters in 2004 (Arian et al. 2007). The Iranian government banned harvesting natural forests in 2017 for a minimum period of 10 years. As such, the wood supply from natural forests is near zero except for small volumes from illegal harvesting. Currently, plantations are the main source of wood raw material for industry as they are not included in natural forests. Annual wood supply from this source is about 6 million cubic meters, including poplar, eucalyptus and wood from fruit gardens. This is planned to double in volume by 2027 (Iran's Natural Resources and Watershed Management Organization 2021). The investment for doing this plan will be covered by the government directly. Besides this, the government plans to promote plantations and support the private sector to develop plantations. All these are planned to increase the wood supply for the Iranian wood industry. Another source of raw material for Iranian particleboard and medium density fiberboard (MDF) industries is sugarcane bagasse, which provides feedstock for the country's two particleboard plants, one MDF plant, and one paper plant in southern Iran.

Total wood imports to Iran are generally increasing and include mainly sawn wood (90%) and other forms of raw wood like roundwood, sleepers, and wood chips (10%). The sawn wood imports to Iran are for the furniture and construction sectors. Total wood imports during the period of 2013 – 2022 showed 220% growth compared to the period of 1995 – 2004. The main source of wood imports to Iran is Russia, supplying more than 90% of total imports.

The value and weight of total raw wood imports to Iran in the past ten years are shown in Figure 4. Imports of wood raw materials for wood-based panels and pulp industries are essentially non-existent due to Iranian Plant Protection Organization regulations and a lack of logistics infrastructure. Because of the shortage of wood sources in Iran, the country does not export raw wood.

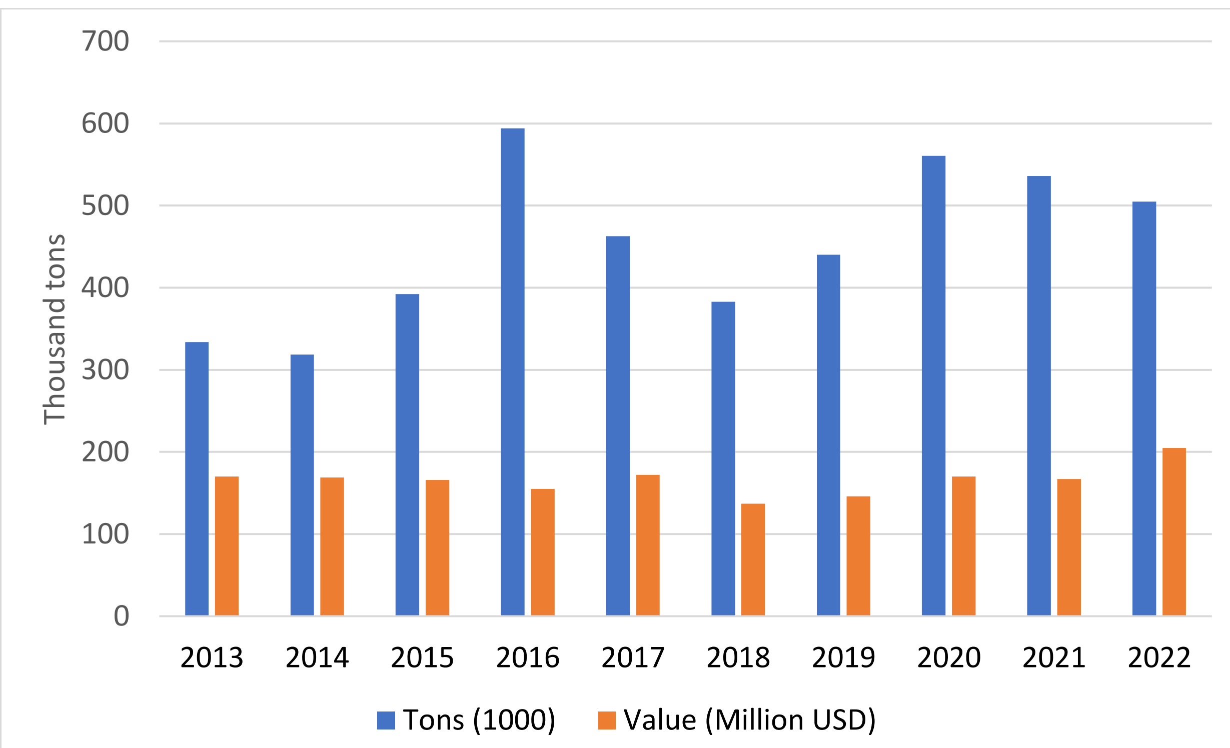


Figure 4. Iran wood imports by weight and value (2013-2022). Source: Iran Customs (2023).

IRAN WOOD PRODUCT SECTORS

Due to long-term sanctions against Iran, access to new technologies is limited, and wood industry owners do not have easy and fast access to updated machinery and know-how to upgrade their production lines. This is not limited to panel producers only (Arian et al. 2012). As a result, the industry faces problems in production quality control and management. Conversely, these sanctions limit the Iranian wood industries' access to the international markets due to many challenges in transferring money and trading with foreign countries.

Particleboard

As shown in Figure 5, the country's particleboard consumption decreased by 42% in 2022 compared to 2013, concurrent with a 24% decrease in particleboard production in this period. Stagnation in the country's construction sector combined with MDF substituting for particleboard and increased competition for limited raw materials are the main reasons for the decrease in the production and consumption of particleboard.

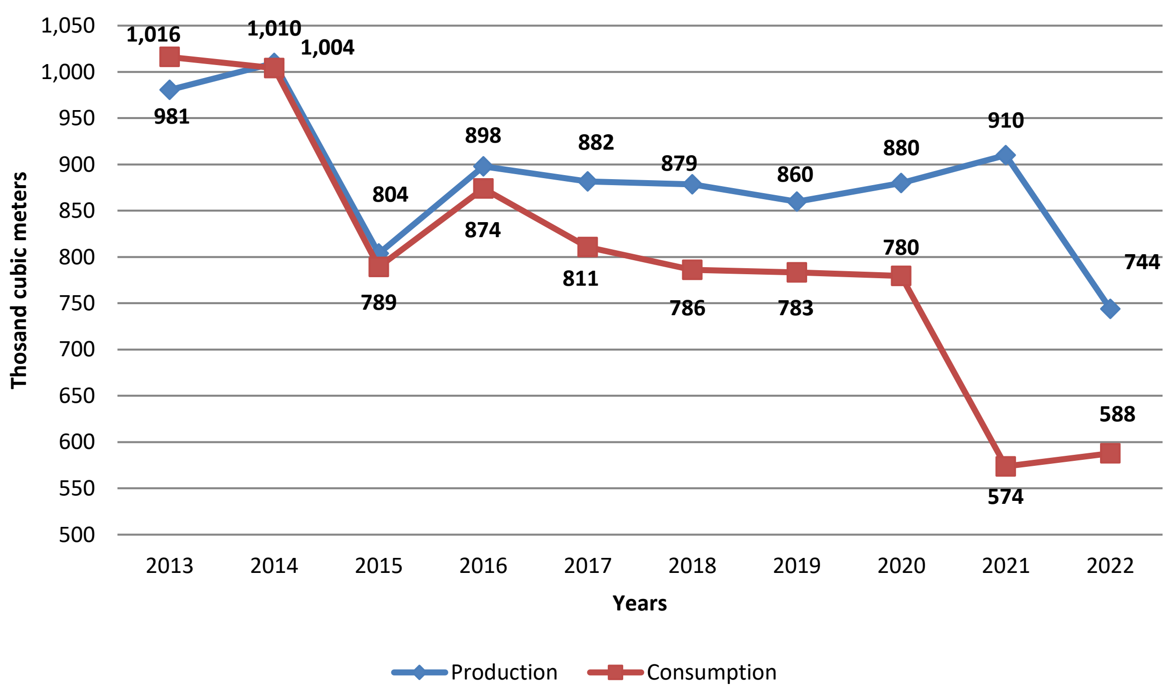


Figure 5. Production and consumption of particleboard in Iran. Source: Iranian Wood Industries Employers Association (2023).

However, according to ,Figure 6 during the years 2013 to 2022, exports have been increasing, but imports have been decreasing since 2013. During the years 2013 to 2022, the import of particleboard to the country has decreased by more than 83%.

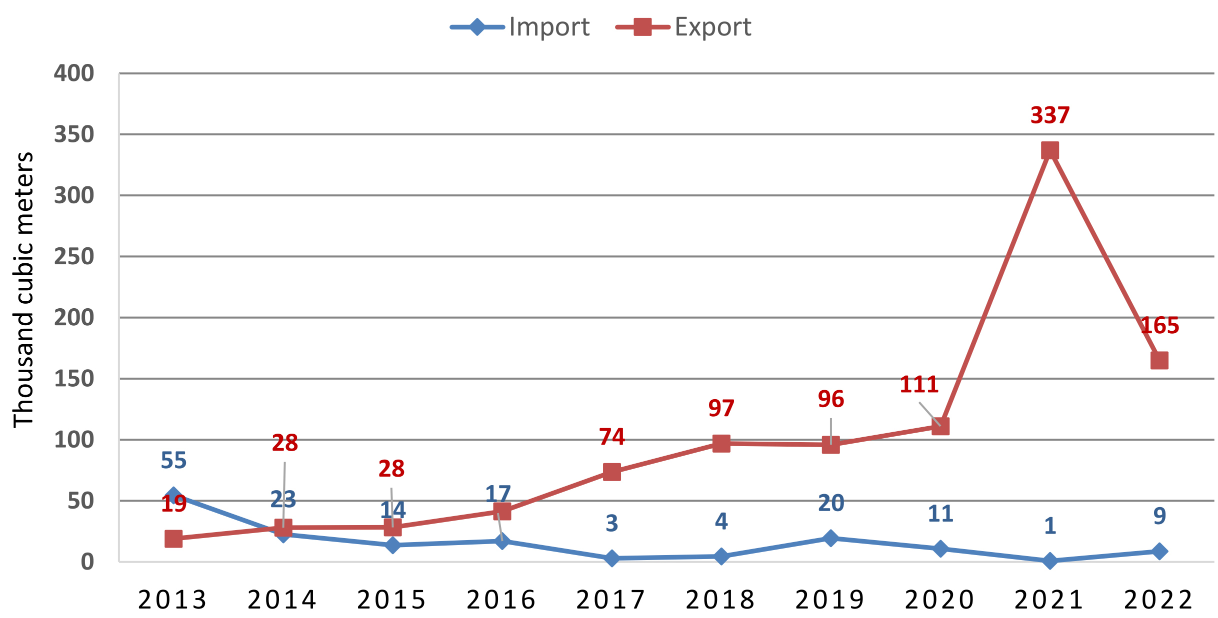


Figure 6. Import and export of particleboard (1000 cubic meters). Source: Iran Customs (2023).

The main reason for increasing exports of particleboard is the increasing exchange rate of the U.S. dollar relative to the Iranian Rial, which makes foreign sales more attractive. For the same reason, there has been a 17% decrease in imports of particleboard.

Medium Density Fiberboard (MDF)

Production and consumption of MDF from 2013 to 2022 are shown in Figure 7. With the increase in domestic production of MDF, the gap between the country's consumption and production has decreased significantly. In 2013, 33% of consumption was supplied by domestic production. Before 2004, all MDF consumed in the country was imported, and in 2005, only 13% of MDF consumption was produced domestically.

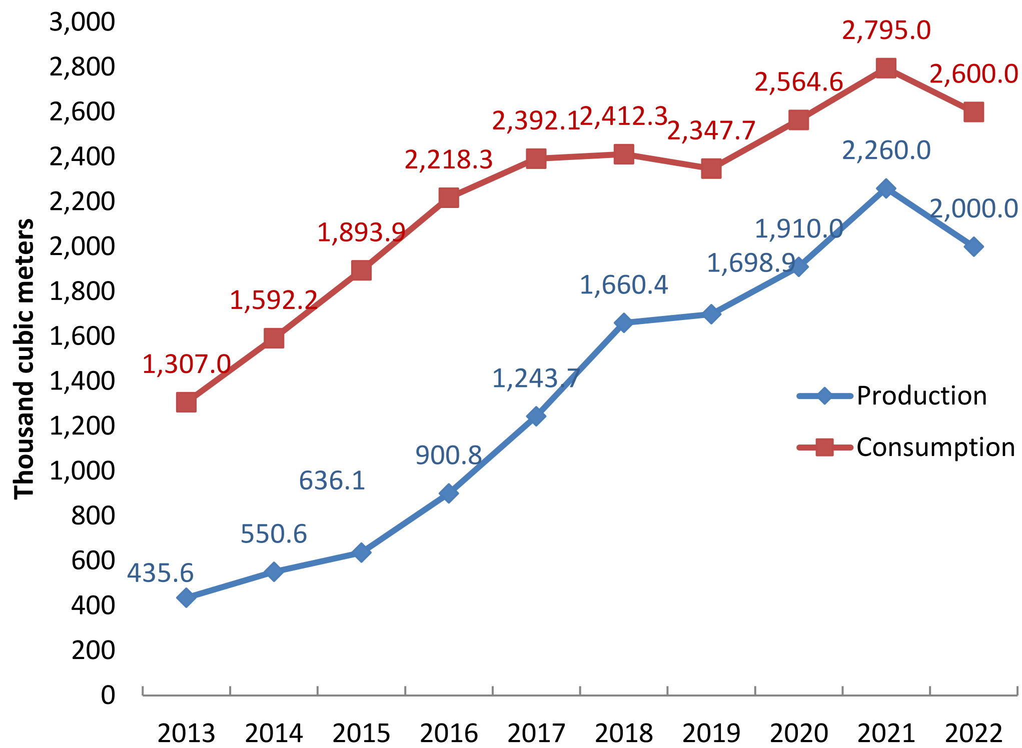


Figure 7. Production and consumption of MDF. Source: Iranian Wood industries Employers Association (2023).

This trend can also be seen in imports and exports. As seen in Figure 8, exports have been increasing, and imports have been decreasing. The high import tax for importing wood-based panels, including 10% for unfinished and 20% for worked or surfaced products, respectively, together with an unfavorable exchange rate and the increase in domestic production capacity are the main reasons for the decrease in imports in this period.

However, imports still play a significant role in supplying the country's MDF consumption. Efforts have been made to increase the production capacity of MDF with governmental support and investment.

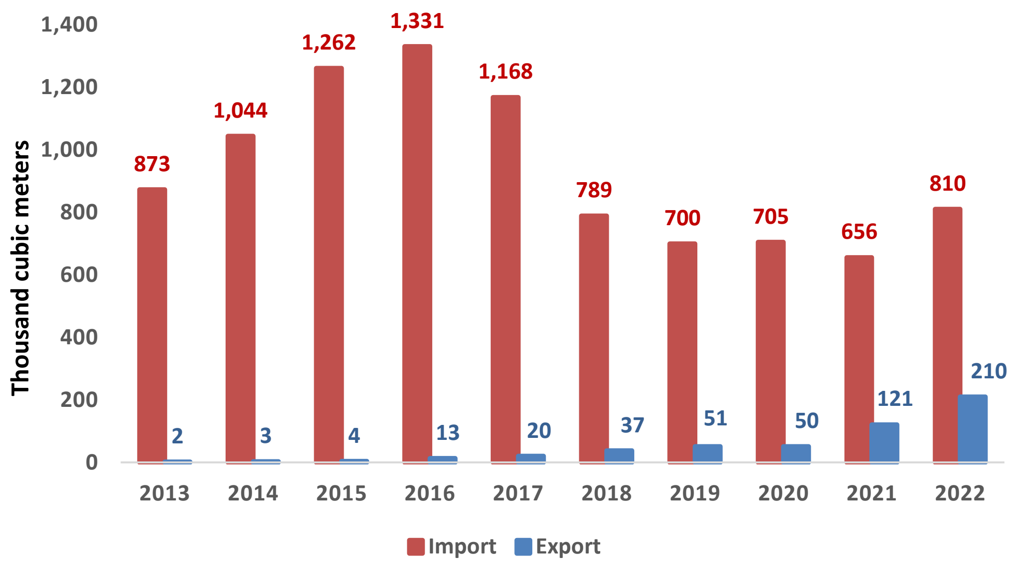
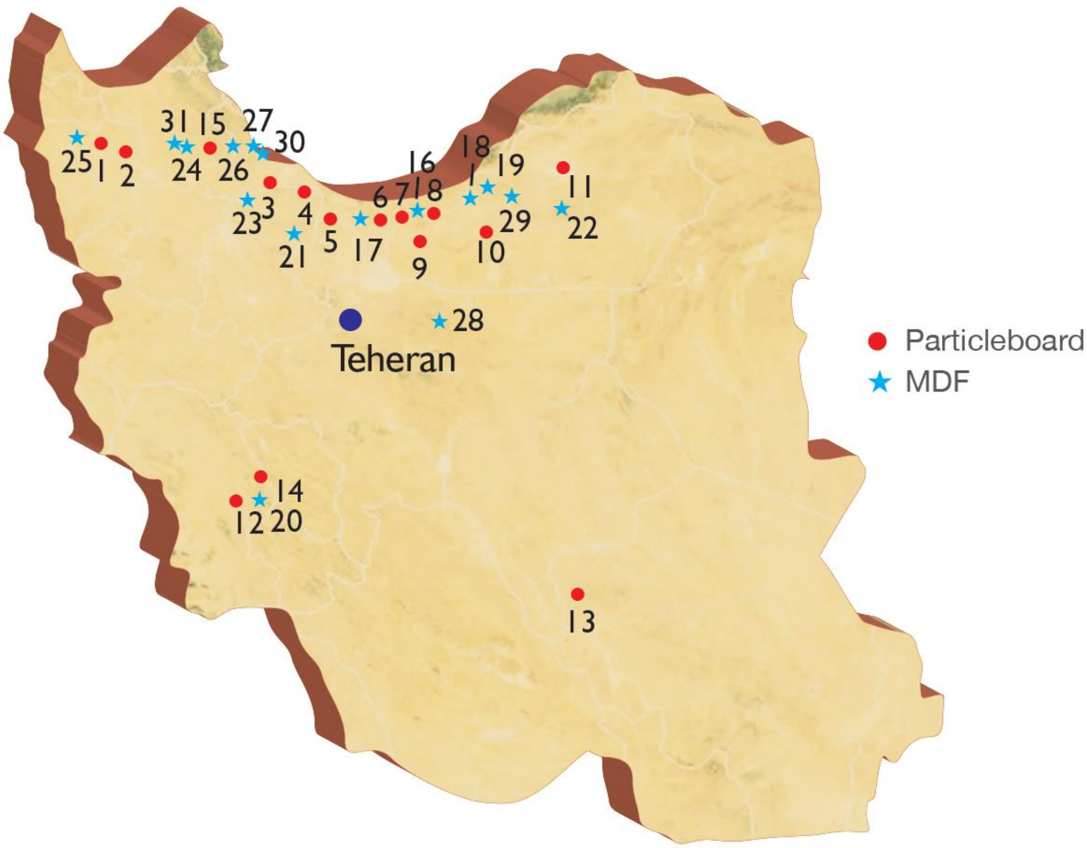


Figure 8. MDF imports and exports (2013-2022). Source: Iran Customs (2023).

Figure 9 shows the distribution and locations of Iran's particleboard and MDF manufacturing facilities. Traditionally, the plants were located in northern Iran near natural forest resources and plantations, which are the main sources of raw material. Production facilities in the South use bagasse as raw material. More than 90% of Iranian wood-based panel enterprises are owned by private sector entities.

Most wood-based panels, both unfinished and surfaced panels in Iran are consumed by the furniture industry. Surfacing material shares of the total market are veneer (4%), high-pressure laminate (2%), PVC foil (10%), paper foil (4%), melamine paper (70%), printing (5%), and no additional surface material (5%).



Particleboard:

1. Melamin Sazeh Tabriz
2. Kebrit Momtaz
3. Neopan Foomanat
4. Pars neopan
5. Shamushak
6. 22 Bahman
7. Neka Choub
8. TFS
9. Pouya Choub
10. TFMG
11. Sanate Choube Shomal
12. Neopan Karun
13. 12 Farvardin
14. Ariana
15. Neopan Khalkhal

MDF:

16. Sanaye Choube Khazar
17. Pars Neopan
18. Arian Sina
19. Arian Shimi
20. Lohe Sabze Jonub
21. Parko
22. Kimia Choub
23. Foomanat
24. Arta
25. Melamin Sazeh Tarbiz
26. Arian Maryam
27. Arian Takhteh
28. Sanate Choub Tarasheh Noghteh
29. Rahasan
30. Vina
31. Negin Zarin Artavil

Figure 9. MDF and particleboard plant locations. Source: European Panel Federation (2022).

Hardboard

Both hardboard production plants in Iran closed by 2005 due to weak market demand. From 1996 to 2005, total annual production was an estimated 22,000 cubic meters. Over the past decade, hardboard imports (including dry process high-density fiberboard) rose to 130,000 cubic meters and then fell precipitously for the remaining five years. A small percentage of imports were re-exported over this time period (Figure 10).

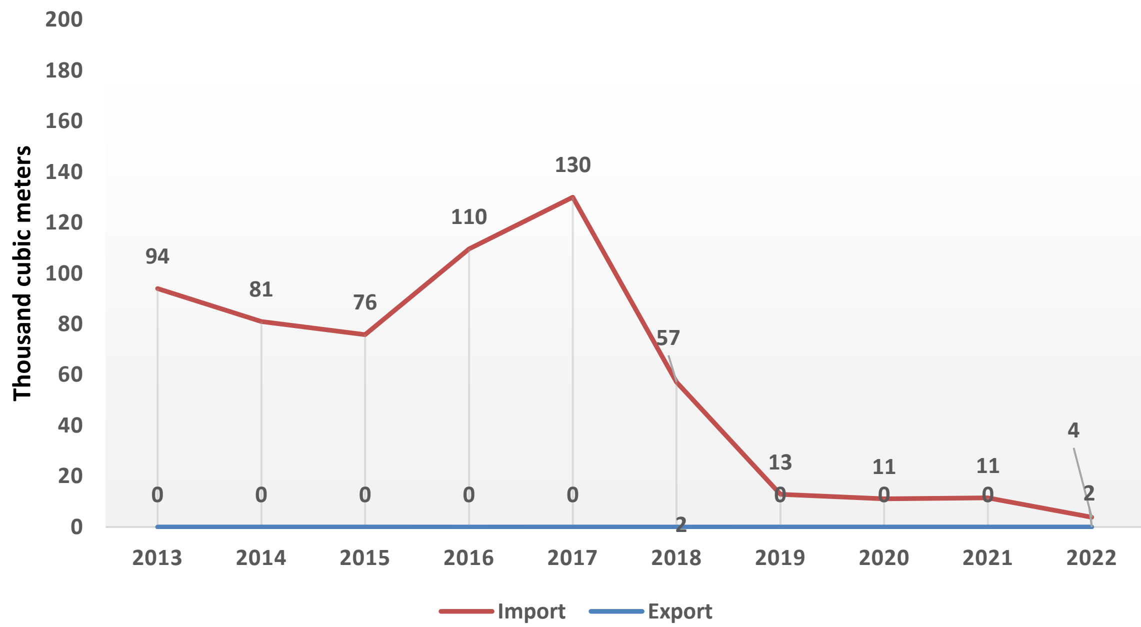


Figure 10. Iran hardboard imports and exports (2013-2022). Source: Iran Customs (2023).

Plywood

Domestic production of structural plywood is non-existent due to a lack of quality roundwood raw materials. Figure 11 shows Iran's export and import of plywood from 2013-2022. As is the case with hardboard, exports are from re-exporting imported products. Imports provide a major part of domestic needs. The lowest volume of imported plywood is in 2018 due to global recessionary influences.

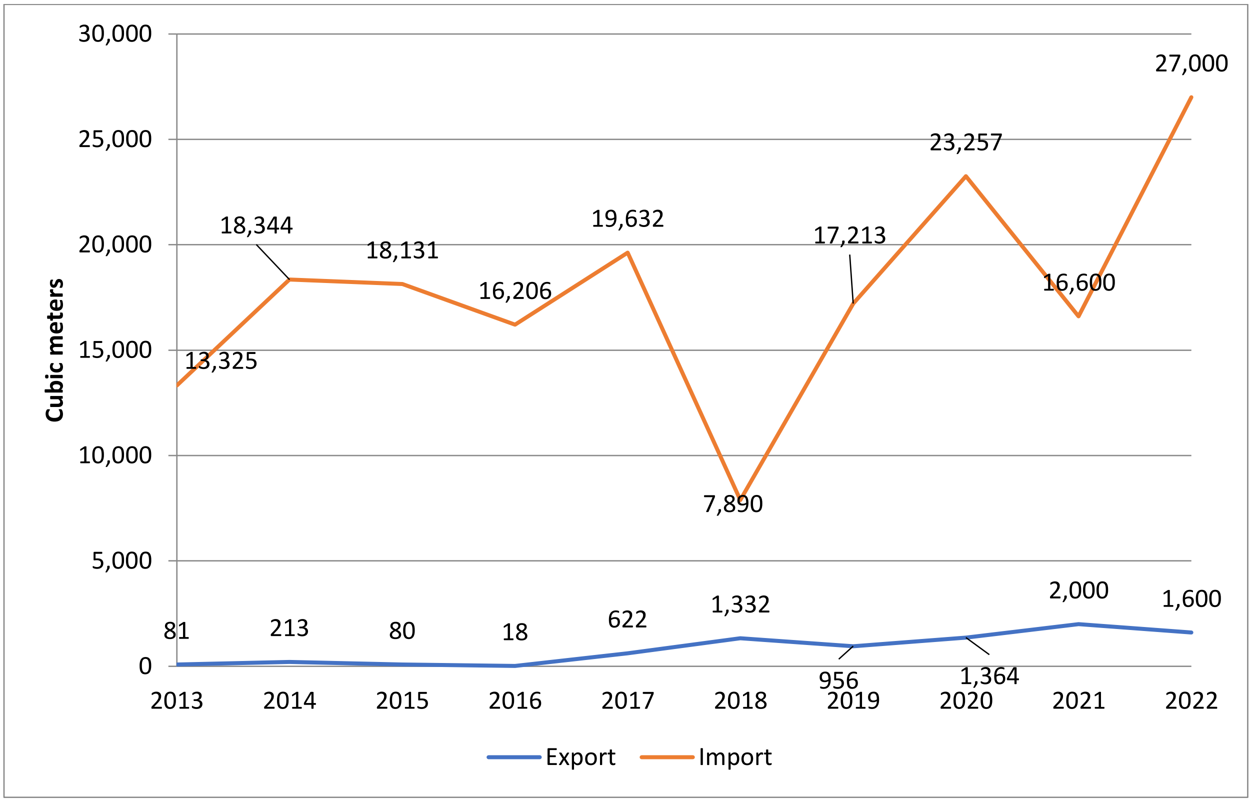


Figure 11. Iran plywood imports and exports (2013-2022). Source: Iran Customs (2023).

Oriented Strand Board (OSB)

According to the Iran Wood Industry Employers Association, there is no domestic production of OSB; the country's needs are met through imports (Figure 12).

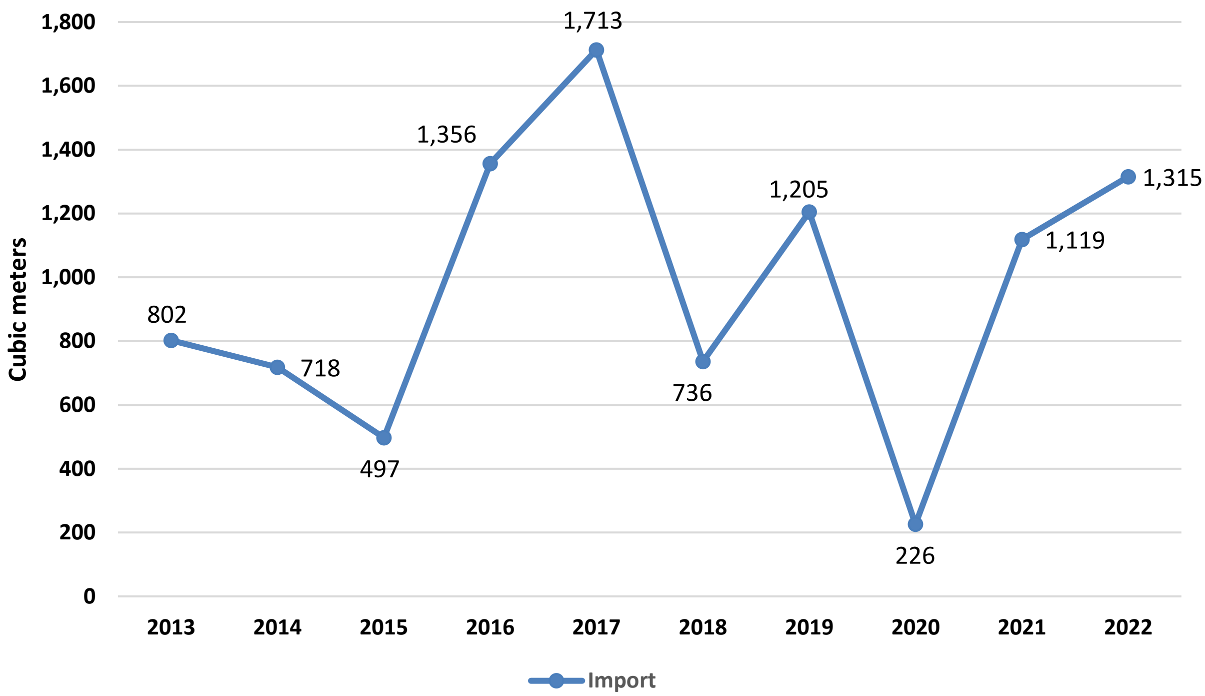


Figure 12. Iran OSB imports (2013-2022). Source: Iran Customs (2023).

Furniture

The oldest form of furniture discovered in Iran are four-legged pottery chairs made about 8,000 years ago. Unique motifs and designs originating from thousands of years ago can be found in modern day wood furniture and crafts. The growth and development of the modern furniture industry in Iran began in the 1970s and large factories were active in the years before 1980. After that, and after the beginning of the Iran – Iraq war in 1980, the growth of the furniture industry, like other industries in the country, was interrupted. After a break in the development of the furniture industry, in 2001, the imports of new machinery and raw materials accelerated sector development. (Iranian Ministry of Industries, Mines and Trade 2019).

Tehran, the capital of Iran, is the largest hub of the furniture trade. In addition to Tehran, the furniture industry has grown significantly in other cities such as Qom, Isfahan, Shiraz, Mashhad, Tabriz and Malayer.

Except for a few large producers, the furniture manufacturing sector is characterized by small and/or family-owned shops. As such, there is no reliable information regarding the number of producers, or the amount of investment made in this industry. However, rough estimates from 2017 pegged the industry at about 65 thousand enterprises of all sizes. For the same year, total sector revenue was estimated to be USD 1.5 billion (Ministry of Industry, Mines and Trade 2019). Another source, the Union of Furniture Manufacturers and Exporters (2022), estimates that the furniture industry accounted for 8% of the country's employment in 2022.

According to the Iranian Wood Industries Employers Association (2023), the value of imported wooden furniture has been decreasing during the period 2013-2022 (Figure 13). One of the reasons for this decrease is the increase in domestic production, while a second reason is the increase in the import tax of these products. The import tax and fee is doubled during this period. Iranian imports in 2013 were less than 1,000 tons, with a value of USD 1.7 million, a decline from an estimated value of USD 6.5 million in 2004 (Arian et al. 2007).

In the same time, exports have been increasing. Iran has become self-sufficient in the wooden furniture industry, and with an increasing exchange rate, it has adopted a policy of expanding exports. Furniture exports have grown since 2016, reaching nearly 16,000 tons with a value of USD 45 million in 2022.

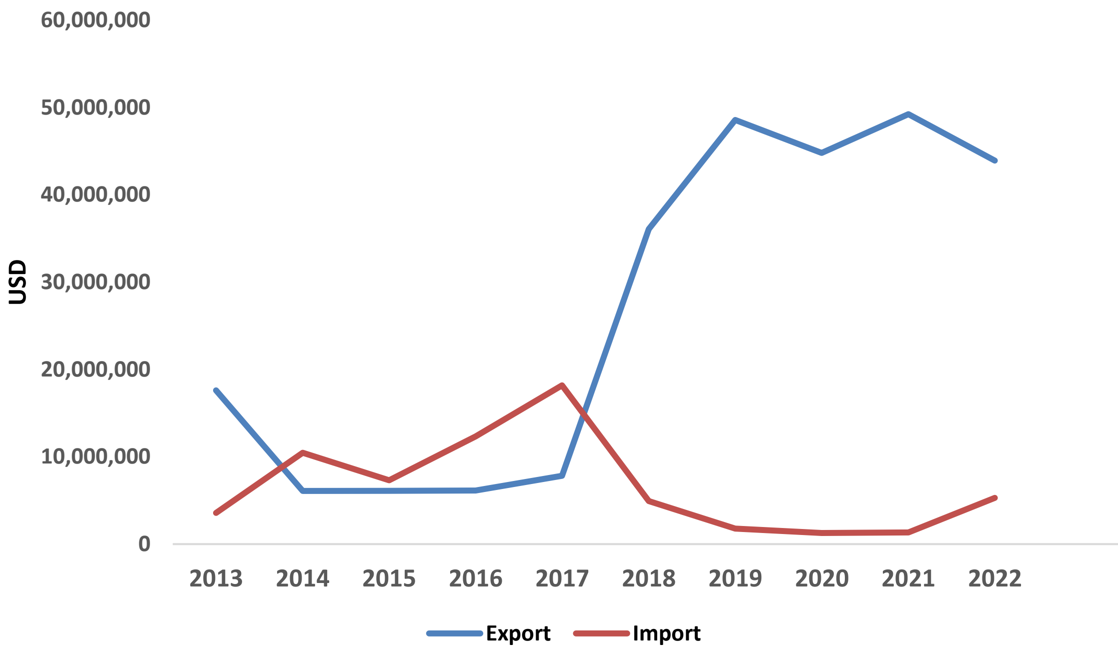


Figure 13. Iran exports and imports of wooden furniture (2013-2022). Source: Iranian Wood Industries Employers Association (2023).

Trade partners

Iran's most important export markets were analyzed for each product during the past ten years. Figures 14 and 15 show the share of each country in Iranian particleboard export and import, respectively, for the period 2013 to 2022. 59% of Iran's imported particleboard came from Turkey, with China in second place with 12%. Turkmenistan, the most significant export destination for Iran's particleboard products, accounted for 60% of total particleboard exports for the same period, followed by Iraq and Afghanistan.

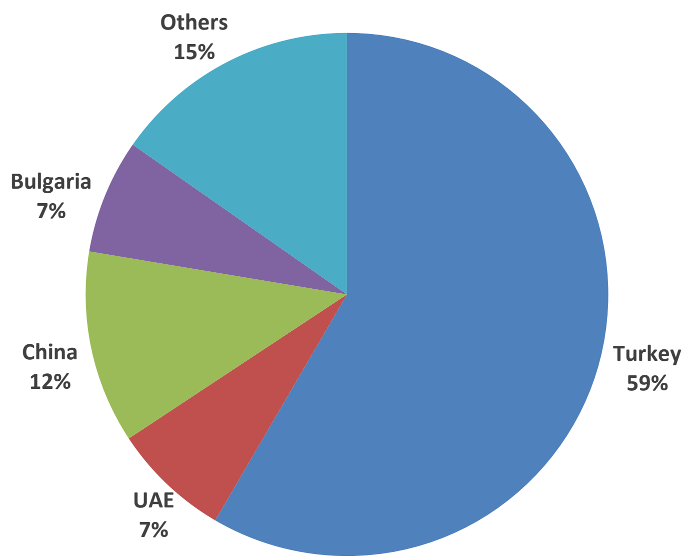


Figure 14. Iran import markets for particleboard. Percent of total imports 2013-2022 (total=155,173 cubic meters). Source: World Trade Map (2023).

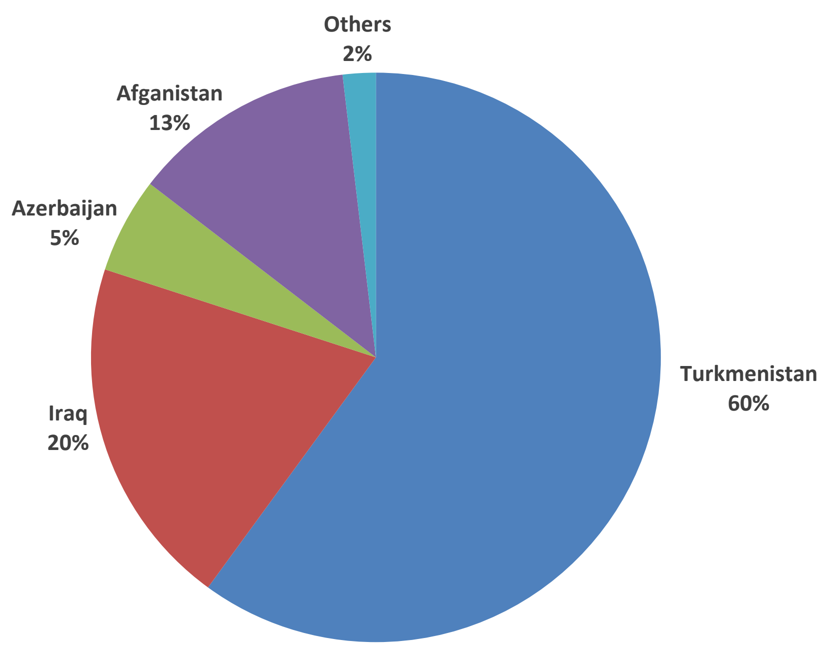


Figure 15. Iran export markets for particleboard. Percent of total exports 2013-2022 (total = 996,686 cubic meters). Source: World Trade Map (2023).

Figures 16 and 17 show MDF's import and export trade partners. According to Figure 16, Turkey is the top exporter of MDF to Iran. This country is the source of 30% of Iran's imports. Thailand with 23%, China with 22% and UAE with 15%, are in successive positions. Afghanistan accounts for 48%, and Iraq, with a share of 43% are Iran's main exports destinations for MDF.

From 2013 to 2022, the import of wood-based panels to Iran decreased while production and export capacity of these products increased. This is mainly because of increased MDF production in the country. MDF has the largest share of consumption within wood-based panels in Iran. However, Iran's share in the world trade of these products is negligible, accounting for 0.01% of the world trade.

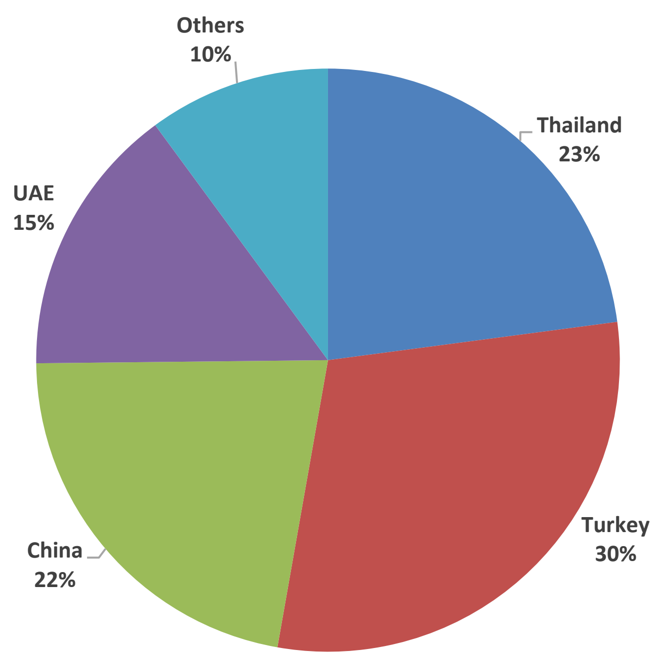


Figure 16. MDF imports to Iran by trade partner. Percent of total 2013-2022 (total = 9,337,736 cubic meters). Source: World Trade Map (2023).

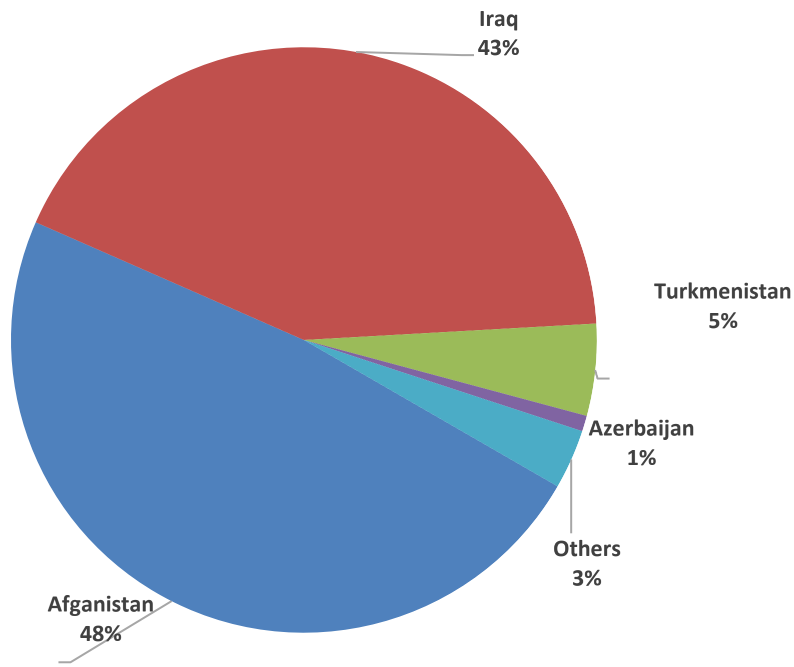


Figure 17. MDF exports from Iran. Percent of total 2013-2022 (total = 510,770 cubic meters). Source: World Trade Map (2023).

Iran's trade partners for imports and exports of wooden furniture for 2013-2022 are shown in Figures 18 and 19, respectively. China with 42%, and Turkey with 38% are the largest furniture import partners, while Afghanistan with 46% and Iraq with 28% are the largest export markets.

As mentioned, Iran's furniture industry has a share of less than one percent of the world markets. This amount shows many missed opportunities in this field. With proper investment and management, export destinations can be increased and by producing quality products, the industry can gain a suitable place in the world trade of furniture.

According to Figure 18, the Iranian furniture industry exports some wooden furniture to high-income countries like Canada, Italy, and Germany. There is potential to increase the amount of exports to these countries and also add other high-income countries to the list of export markets. This needs more market study and promotional activities in these target markets.

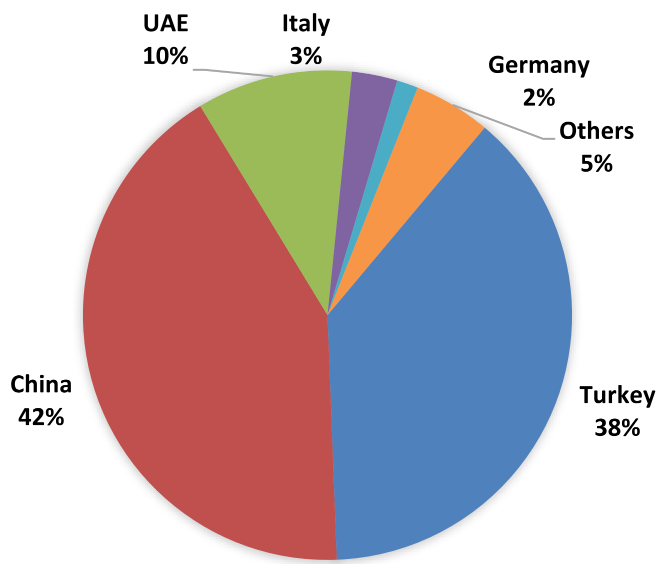


Figure 18. Furniture imports to Iran by trade partners. Percent of total 2013-2022 (total = 66,516,807 USD). Source: World Trade Map (2023).

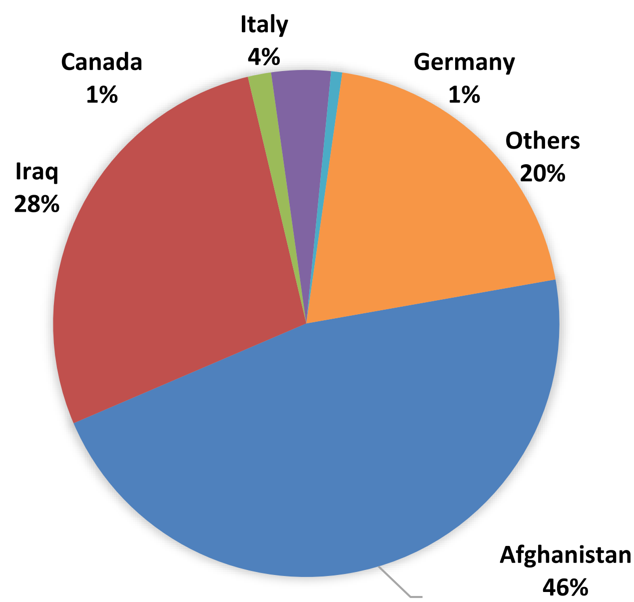


Figure 19. Furniture exports from Iran by trade partners. Percent of total 2013-2022 (total = 266,454,281 USD). Source: World Trade Map (2023).

CONCLUSIONS

The wood industry sector in Iran is fast-growing, and both the previous study conducted by Arian et al. (2007) and this study show the upward trend in the production and consumption of most wood products. The population of Iran and the surrounding region constitutes a significant market for Iranian wood products. Advantages include a robust complement of wood products manufacturing experts, inexpensive labor, and low energy costs. However, there are challenges facing all the Iranian industries, including the wood products sector, such as international sanctions imposed against Iran, high inflation, decreasing purchasing power and lack of foreign investment. In addition, there are challenges and barriers specific to growth in wood-based products, particularly panels, pulp, and furniture. The most severe issues are insufficient volumes and quality raw materials. As such, domestic wood production is not sufficient for further expansion, let alone provide for current industry needs. Due to the country’s dry climate, plantation programs cannot be relied upon to fill the gap in raw material shortages. As a result, wood imports are the main driver in bolstering the sector. Other factors that can improve trade competitiveness are investing in infrastructure, particularly ports, enhanced phytosanitary processes and equipment, improved logistics as well as targeted economic incentives (Arian 2016).

The industry needs a dynamic strategic plan of growth developed in concert with government support and programs. Although technical training programs are sufficient, the industry needs to improve managerial skills and apply up-to-date business management tools and methods. The Association of Iran Wood Industry Employers supports training and information sharing for the wood-based panel industry. The Association should play a basic role in collecting and accelerating the abilities of individual wood industry members to reach the development goals. A strategic plan for the development of the Iranian wood industry is newly compiled by the association which is a crucial step forward and should be followed by the association and its member companies. Lobbying with governmental organizations to get their support and incentives in line with wood industry development is another strategy suggestion for the wood industry associations. Considering the fact that the main challenge of the industry is a shortage of wood raw material, the Association can make strategic alliances between wood industry companies to collect small and individual purchases and do wood raw material imports in collected big amounts to make it more economically feasible.

Several Iranian universities have wood and paper industries engineering programs for undergraduate and advanced degree students. The quality of education in these universities is good, but they should update their programs to keep up with changing industry needs. Another important policy for the universities is to add more managerial skills and courses to their programs. The industry needs wood industry experts with good management knowledge to find and use new technologies and know-how.

In summary, the wood industry has been essential to Iran's economy and traditions going back thousands of years. If barriers to growth can be eased, we believe that the sector could develop stronger competitive positions in domestic production, opening and expanding export markets, reducing reliance on product imports, and generally returning to a sector of strength.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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