The Scenario of Textile Industry in Malaysia: A Review for Potentiality

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Abstract
This study explains the current situation and the significance of the textile and clothing industries in Malaysia, as well as how they are depicted. Textiles and clothes are the most important elements in human life and modern civilization. Furthermore, the textile industry is the foundation of industrialization for any country around the globe, and the economy of developing countries today is largely dependent on this sector. Once upon a time, Malaysian textiles and apparel were a major source of foreign cash. It is, however, presently erupting. This paper would be an adequate foundation for establishing the textile and garment business on a huge scale in Malaysia. Textile industrialization, the structure of the Malaysian textile industry, export and import states, gross domestic product (GDP) performance, energy consumption, product mix and customer, health, and safety issues have all been thoroughly addressed in this study. To summarize, the textile and garment industry has a substantial impact on Malaysian GDP, imports, and exports, as well as existing industries that produce items for global customers. Upstream textile industry numbers must be increased in tandem with downstream textile industry numbers so that the textile sector may contribute significantly to Malaysia’s GDP and export–import orientation.

Keywords Textile industry · Industrialization · Malaysian textile industry · Textile product · GDP

Introduction
Industrial development is the only way to ensure ultimate and sustained growth rates, as industrialization is the soul of economic growth and human progress. Not only that, as green industrialization, industrialization now encompasses a wide variety of social, political, and technological scientific research, as well as an active and sustainable framework for exploring the priorities of human life and civilization (Farhana et al., 2015a, b; Holton & Nasson, 2009; United Nation, 2016; United Nations Development Programme, 2016). The textile industry has played a critical part in the development of human civilization over this period. It is a vital sector for countries all over the world to improve their economies (de Souza et al., 2010; Puig et al., 2009). In addition, it is the current market in the global industry. This industry has a complex manufacturing chain and a diverse structure (Wadje, 2009). The end products are manufactured by several distinct sub-sectors. The agricultural, chemical fiber, textile, fashion, retail, service, and waste management industries are all included (Beton et al., 2014; EC, 2003). The textile industry has a big impact on the world economy, especially in nations such as China, India, Pakistan, Bangladesh, and Malaysia (Ajmair & Hussain; Bilińska et al., 2016). Malaysia is the world’s leading emerging country in terms of industrial growth and exports, as well as internal infrastructure for commercial clothes trading and expansion of manufacturing industries and services over the last decade (Esho, 2015; Wadud, 2008). Clothing used to be one of the top three foreign exchange earners in Malaysia, but today it is the fastest-growing sector (Boon et al., 2013). Currently, baby clothing, toddler clothing, casual wear, basics, formal dress, and other items are all part of the apparel industry. In Malaysia, increased income and customer confidence are propelling the garment industry forward. Women are becoming more empowered and financially independent as their labor participation and salaries rise. They are more likely to express themselves and feel good about themselves through modern fashion. Many Malaysian fashion designers are
optimistic about the future. As a result, Malaysia is known as a burgeoning emerging fashion capital. Malaysia’s population of people aged 25 to 29 has been steadily increasing in recent years, and this trend is predicted to continue in the forecast period. The apparel sector will experience a boom in demand in the projected period due to this group’s preference for rapid fashion. During the forecast period, the Malaysian textile manufacturing market would be driven by the growing demand for garments (Intelligence, 2021; MITI, 2020; Yan et al. 2022). According to the Malaysian Department of Statistics, the textile and apparel industry contributed 1.70% to the increase of the manufacturing sector’s GDP in 2012 (DOSM, 2013). The Third Industrial Master Plan (IMP3) has identified it for continued advancement based on the industry’s prospects. As a result, it has the greatest projected annual growth rate of exports, at 7.80% each year. The preceding demonstrates that the industry has the potential to be studied (Poo et al., 2012). Moreover, to accelerate development, the government has played a key role in supporting export-oriented manufacturing in the garment and textiles to the economy to the worldwide market. As a result, the textile and apparel sectors have improved greatly in terms of Malaysian GDP and total exports as well (Athukorala & Menon, 1995). The goal of this research is to present a broad overview of Malaysia’s textile sector. The relevance of textile industries in various growing nations, the structure of the Malaysian textile industry, Malaysian textile import and export conditions, Malaysian product mix and customers, energy use, and the impact on Malaysian GDP were all investigated in this study.

Background of the Study

Agriculture, petroleum, g, mining, tourist, textile, and clothing sectors are among the industries that rely on and maintain industrialization (Kniivilä, 2007). These industries require a big enough foundation to meet all the world’s goals and ambitions. Economic liberalization, export promotion, expanded trade opening, and a better business trend are all impossible without this modernization. The basic materials for industrialization are steel, iron, cotton, and coal (Lagu et al., 2015; Mahamude et al., 2021; Schönberger & Schäfer, 2003). The textile industry in China is a foundation of the modern economy, contributing significantly to foreign exchange earnings and economic progress (Jiang et al. 2010). Furthermore, China’s membership in the World Trade Organization (WTO) in 2001 ensured the entry of stable, flexible, and predictable export markets, as well as allowing China to become the world’s third-largest exporter (Shah et al. 2013). China’s exports account for more than a third of the country’s GDP (Çukul, 2008; Lemoine & Ünal-Kesenci, 2003). Textile industrialization now has a substantial impact on most emerging countries, including Bangladesh, India, Turkey, Pakistan, Sri Lanka, Tanzania, Sudan, and several sub-Saharan African countries. At the start of the industry, this sector absorbs a huge number of skilled and semi-skilled workers, as well as very little technology. Furthermore, because most emerging countries are overcrowded, there is a great chance to make use of this population and textile industrialization (Siddiqi et al., 2012; Syduzzaman et al., 2015; Yunus, 2010). The textile industry helps developing countries grow their GDP, gain more foreign currency, and improve their exporting and importing commerce. As a result, various internal concerns such as improved trading, employment, internal improved transportation, flourishing natural fiber production and cultivation, socioeconomic development of rural people, significantly improved impoverished people’s living, and so on have improved. Furthermore, this industry of emerging countries has just begun to use cutting-edge technology to produce a variety of fabrics and clothes. They use advanced machinery and automation to generate a wide range of fibers and yarns for stylish and unique garments (Choubey & Agrawal, 2016; Farhana et al. 2015a; Kelegama, 2005; Lal, 2006; Wolbers, 2009).

Table 1 shows the importance of the textile industry in various countries. The commencement of textile industrialization, the qualities of raw materials, the impact on specific GDP, and the potentiality of diverse regions of textile goods are all neatly listed in Table 1. Except for China, all these countries began their textile journey at the turn of the nineteenth century. Cotton fibers are also used as a raw material in the textile industry in most nations. Textile industrialization has a significant impact on the GDP of the relevant country. These countries are capable in a variety of ways, including knit apparel potential, textile free trade, textile machinery, and increased clothing output. However, there are some disadvantages to the textile business as well. Gaseous pollution and solid waste disposal have had a significant influence on both the environment and human health in this industry. Furthermore, this gaseous pollution denotes greenhouse gas emissions, which have resulted in a rise in global warming (Huang et al., 2016; Kant, 2012; Zaffalon, 2010). Aside from that, solid waste mostly pollutes the earth’s water and soil with various dyestuffs and chemical waste, all of which are extremely detrimental to the environment and human health (Akarslan & Demiralay, 2015; Farhana et al., 2022; Ruzmai & Byalko, 2015).

Malaysian Textile Industry

For decades, a developing country like Malaysia has been a worldwide competitor. Malaysia has maintained quick and inclusive economic growth, as well as real GDP, at a significant 6.4% per year since 1970 to become a modern,
Malaysia’s economy has become one of the world’s fastest-growing economies because of this vocation. Malaysia’s economy grew quickly as a result of the industrial and service industries, as well as the textile and garment industry (Lee et al. 2016). Not only that, but the apparel market’s growth rate is extremely outstanding as a result of the increased demand for the sector; the apparel sector’s overall expansion rate over the last 5 years has been quite impressive as displayed in Fig. 1 (Intelligence, 2021). However, due to the Covid-19 epidemic, the development in 2020 is showing a downward trend (Fig. 1).

**Structure of the Textile**

The textile industry, which includes agricultural and chemical fibers, textile, apparel, retail, service, and waste management, has a convoluted production process among all manufacturing industries. From raw materials or sourcing raw materials to intermediate production processes (yarn, woven fabric/knit fabric, dyeing, and finishing processes) to sewing (consumer products such as apparel, home textiles, towels, carpets, and industrial fabrics), this industry is divided into sub-sectors (Baydar et al., 2015; Beton et al., 2014; Prevention, 2003). There are mainly two types of fiber used in the textile industry: natural and manmade. Cotton is the most frequently used natural fiber, with about 82% of the world’s population using it (ICAC, 2013; JRC, 2002a, 2002b). Malaysia, on the other hand, imports raw cotton and exports human-made fibers, with 50% of human-made yarn output destined for export. Human-made fiber production climbed by 4.3% yearly from 2005 to 2014, from 0.4 to 0.5 million tons (filaments, 2016). The

### Table 1 Importance of textile industry and overall scenario in a different country

| Country | Beginning of textile industrialization | Raw materials | Effect on GDP | Remarks | References |
|---------|----------------------------------------|---------------|---------------|---------|------------|
| Tanzania | 1966–1985 | Cotton | 25% to GDP in the manufacturing sector | Potential in knit apparel | ACTIF (2011); Gabagambi (2013); Kinabo (2004); TDU (2015) |
| Pakistan | 1957 | Cotton | 9% | Challenges in a new era of free trading | Ahmed (2008); Azeem et al. (2017); Khaliji et al. (2013); Latif and Javid (2014) |
| Turkey | 1923–1962 | Cotton | 10% | Quite potential for textile machinery | De Mooij and Lejour (2004); Gazanfer (2004); MOE (2017); USDA (2015) |
| India | 1900–1960 | Cotton, silk, and jute | 4% | Colossal potential but facing several obstacles | ASA (2015); Assocham (2015); Rizvi and Jaswal (2013); Sawhney (2016) |
| China | 1870–1949 | Cotton, silk, wool, and synthetic fiber | 7% | Economic pillar but GHG emission to the environment | Hong et al. (2016); Huang et al. (2016); Qiu (2005); Wang et al. (2012) |
| Bangladesh | 1970 | Sourcing from outside | 13% | Foreign currency mostly depends on it, but raw materials are the primary drawback | Hasan et al. (2016); Noor-E-H and Ahsan (2016); Rahman and Siddiqui (2015) |
| Sri Lanka | 1973–1977 | Cotton and sourcing | 16% | highly appreciated for ethics, value, and volume of products | Embuldeniya (2015); Jayawickrama and Thangavelu (2011); Samarasinghe et al. (2015); Weerakoon and Thennakoonly (2006) |

![Fig. 1 Expansion rate of the apparel market in Malaysia](image-url)
scenario of the textile industries’ complex manufacturing chain is depicted in Fig. 2 (Shanmuganandam, 1997).

At present, the textile and clothing industry is playing some essential activities in Malaysia. The structure of the Malaysian textile industry is classified into two main sectors: downstream and upstream (MATRADE, 2013). Table 2 shows the structure of the textile industry in Malaysia. However, the downstream manufacturers are now concentrating on promoting valued textiles while upstream activities required more capital at ten times higher (Intelligence, 2003). Recently, over 662 factories are involved in operating and producing various textile products from fibers, yarns, and fabrics, then dyeing, printing, and finishing are done on this fabric to make a complete garment (MIDA, 2011). Presently, more than 1000 downstream and 900 upstream companies are involved in different activities. However, Malaysian industries are not investing upstream whereas they are concentrating on the downstream industries by receiving an order from those countries which are newly industrialized (Rashid, 2014). Consequently, they could not participate as an essential part of economic growth in Malaysia. The size of Malaysian textile industries is mainly two types such as small and medium. Moreover, some large-scale vertically integrated enterprises are situated here; most of them are established with foreign investment and services for the international market (KONG, 2016). The small and medium-sized vendors are illustrated in Fig. 3 (Directory, 2013). Although Malaysia does not produce cotton, the Malaysian people consumed cotton considerably. Malaysia imports most of the cotton from the USA (2%), Australia (22%), and Brazil (20%). Cotton yarn production and cotton usage in Malaysia increased significantly from year to year, and Table 3 shows its scenario from the fiscal year 2008/2009 to 2019/2020 (USDA, 2016) which determines the rising trend in Malaysian civilian’s use of cotton.

**Textile Product Mix and Customers**

Now, any company’s performance is directly related to customer satisfaction, attitudes, and relationship with the companies. Moreover, the customer’s mind is now changing so quickly about their clothing and other product usage behavior. Besides consumer behavior also depends on age and gender. According to demand and changing the behavior of the customer regarding clothing, textile and clothing industries are synchronizing their strategy and technological development and react promptly to those changes (Brosekhan et al., 2013; Caro & Martínez-de-Albéniz, 2015; Rodrigues & Figueiredo, 2013; Shih et al., 2015). Furthermore, textile and clothing industries are adjusting to spirited competition and small life cycles, high production, an enormous variety of products, high volatility, and high inspiration for purchasing along with another phenomenon (Christopher et al., 2004; Şen, 2008; Shih et al., 2015). In this circumstance, Malaysian textile industries have been moving up the value chain by diversification on manufacturing processes for higher-valued textile products and implementing automatic and computerized machines for product processes (Ho et al., 2012; Lam & Postle, 2006; Ma & Zhang, 2009; Shahmaghsoud, 2013; TESTEX AG, 2015). They also found the business collaboration with foreign industries to gain new technologies and technical development activities to develop and establish new procedures, new applications, and value-added products (JETRO 2012; TESTEX AG, 2015). Since the 1970s, Malaysian textile and clothing industries are well experienced and robust enough to serve world-famous brands like Nike, Ralph, Kohl’s, Reebok, Adidas, Gucci, Gap, Oshkosh, Puma, Calvin Klein, Walt Disney, Alain Delon, Ashworth, Under Armour, HandM, Burberry, and Uniqlo (Seong, 2007). Instead, the consumers are attracted more to the global brand in Malaysia like in many other developing countries as customers are likely to buy quality attributes and branded fashion products (Tajuddin et al., 2014). Besides, the domestic consumption market is dominated by some international brands such as Nike, Zara, Levi’s, and GAP. Different Malaysian textile and clothing products are listed in Table 4, which obtained a valuable position in the world market due to high quality, reliability, and quick delivery (Economic, 2007; MATRADE, 2013).

**Import and Export Status**

The textile clothing and footwear industry continued its 10th position in exporting earnings in 2016 surmounting the challenges. The export is valued at RM 13.8 billion. Previously in 2015, it was 13.2 billion (MITI, 2015, 2016). According to the Malaysian Investment Development Authority (MIDA, 2011), over the last 4 years, the inspiring investment in the Malaysian textile and clothing sector increased significantly. Moreover, in this sector, foreign investment is a significant part (around three-quarters of total investment), and domestic investment was quite slow for the last 6 years except in 2014 (MEIF, 2016). Besides in 2014, the foreign and domestic investment in manufacturing as well as in textile and clothing was impressive, and it was about 50% of total investment. The Malaysian production index in 2015 was 4.8, and the textile, clothing, and footwear index was 7.5 in 2015 (MEIF, 2016; MITI, 2014, 2015). Several important initiatives have been taken by the Malaysian government to establish the textile sector over many years to work up import and export for textile products. Therefore, a significant improvement has been noticed in the export zone of the Malaysian textile sector.

Except for a brief dip during the COVID-19 lockdown limitations, Malaysia’s textile manufacturing industry has been steadily growing. It is the tenth highest earner among...
Fig. 2 Flowchart of textile production processing. Source: Shanmuganandam (1997)
Malaysia’s export industries. The textile industry, along with a few other industries, was a priority when Malaysia pursued Export Oriented Industrialization. As a result, the industry has experienced consistent expansion over time. In addition, the country’s textile exports have increased. The increasing global demand for high-quality clothes and textiles from Malaysia is driving this upward trend in textile exports from Malaysia. Another cause for the expansion is an increase in the purchasing power of major importing countries such as the USA, EU countries, and Canada. Malaysian textiles are only exported to a few countries. Most of the product is shipped to the USA, which accounts for USD 429.94 million (13%), followed by Japan, which accounts for USD 392.3 million (9.53%), and Turkey, which accounts for USD 392.2 million (9.53%). The scenario of export values of Malaysian textile over the last 9 years is shown in Fig. 4 (Intelligence, 2021; MITI, 2020; Statista, 2022).

In 2014, Malaysia imported 43% of its yarn, and 33% of its fabric from China, and the remaining are from different countries. The total import value is RM 4.9 billion (MOF, 2015). Value-added manufacturing sectors slightly climbed by 5.6% in the first quarter of 2015 (previously it was 5.4%), assisted by a tremendous performance of export-oriented manufacturing industries which expanded by around 6.3% in the first quarter of 2015 (prior it was 5.4%) urged by electrical and electronics products, chemical and its products, petroleum, wood, and wooden products (MOF, 2015). Moreover, in the case of textile, apparel, leather, and footwear, it was 9.7%. In 2015, the productivity of Malaysia was evaluated by real added value per employee and increased by 3.3% to RM 75,538 from RM 73,091 in 2014 (MITI, 2015). Productivity growth is a contributing factor to the nation’s higher growth in GDP which was at 5.0% this year (MITI, 2016). The manufacturing sector recorded the highest productivity performance in 2015 with a growth rate of 7.0%. The productivity of the manufacturing industry increased to RM 105,226 from RM 98,307 in the previous year (MITI, 2015, 2016). Furthermore, during the last few years, the import of textile materials from many nations in Malaysia has remained stable, which is quite important in the Malaysian environment. Table 5 shows the overall import values of textiles and apparel from various regions.

### Energy Usage

The textile industry is the primary iron horse sector, especially in developing countries (TMOSIT, 2012). It is covered by a vast number of sub-sectors together which consume a significant amount of energy. The total energy consumed by the manufacturing textile and clothing industries also depends on the individual country (Hasanbeigi, 2010; Hasanbeigi et al., 2012; Kocabas et al., 2009). For instance, in China the textile industry consumed about 4% of the total energy used in manufacturing industries whereas it is less than 2% in the USA (Liu et al., 2012; US, 2006). Usually, the textile industry consumed energy in two forms such as electricity and oil, coal, or natural gas. Electricity is used for different types of machinery (spinning, knitting, weaving, and sewing), air conditioners, lighting, and office usage. Moreover, oil, coal, or natural gas is used as fuel for boilers.
that generate steam which is used mainly for various machinery, as a composite textile industry accomplished with the spinning, knitting/weaving, wet processing (dyeing/printing/finishing), and sewing sectors in a single unit (Grave et al., 2015; Maia et al. 2013; Ozturk, 2005). However, in different sub-sectors of the textile industry, energy usage behavior is different for its various activities (Martínez, 2010). Table 6 shows a distribution of energy consumption according to the processes of the textile industry. Mostly, the use of electricity in each machine differs according to the type of machinery and the factory scale (Hasanbeigi & Price, 2015). Therefore, this cannot be treated in a standardized manner just as the spinning sector consumed a massive amount of electricity and the wet processing unit used a plentiful amount of thermal energy (Belaid et al., 2009; Jarek Gontek et al. 2012; Moin & Mahabubuzzaman, 2009; Sharma et al., 2016). Figure 5 shows the breakdown of standard electricity and thermal energy consumption in a composite textile plant (Sathaye et al., 2005). The spinning and weaving sections combined electricity use of around 69%. On the other hand, the dyeing and finishing sections use thermal energy for about 50% of the total cost.

In Malaysia, energy consumption is high in the industrial sector. However, there are not many kinds of literature on textile energy consumption in Malaysia. Besides, the rapidly increasing demand for energy which results in the depletion of fossil fuels and the emission of greenhouse gas into the environment is a burning issue for any country on this earth

**Table 4** Malaysian textile and apparel products

| Textiles | Apparels |
|----------|----------|
| • Fibers | • Skirts |
| • Yarns: (i) natural yarns such as cotton, wool, flax, silk; (ii) human-made yarns such as polyester (spun and filament), nylon, rayon, acrylic, textured nylon; and (iii) blended yarns such as wool/acrylic, polyester/cotton, CVC yarn, polyester/acidic | • Shirts |
| • Woven cotton fabrics | • T-shirts |
| • Wove mixed fabrics | • Trousers |
| • Woven fabrics of human-made textile fibers | • Blouses |
| • Knitted or crocheted fabrics | • Coats |
| • Lace, braids, ribbons, trimmings | • Overcoats |
| • Carpets and rugs | • Undergarments |
| • Bed coverings, bedsheets, curtain, pillow covers, table coverings | • Handkerchiefs |
| • Industrial clothing such as ropes, cords, car seat fabrics, geotextiles, and tents | • Vests |

![Fig. 4 Malaysian textile export values concerning different years](image)

![Table 5 Import of textile, clothing, and footwear over the last 5 years](table)

| Countries | 2015 | 2017 | 2018 | 2019 | 2020 |
|-----------|------|------|------|------|------|
| PRC       | RM million | Share (%) | RM million | Share (%) | RM million | Share (%) | RM million | Share (%) | RM million | Share (%) |
| Vietnam   | 8266.2 | 1.2 | 8800.8 | 1.1 | 8481.8 | 1.0 | 7274.1 | 0.9 | 7179.7 | 0.9 |
| Indonesia | 37.8 | 0.02 | 1415.4 | 0.2 | 1573.3 | 0.2 | 1650.0 | 0.2 | 1309.4 | 0.2 |
| India     | 1002.3 | 0.1 | 1028.2 | 0.1 | 1015.1 | 0.1 | 899.6 | 0.1 | 718.6 | 0.1 |
| Bangladesh| 596.7 | 0.1 | 729.9 | 0.1 | 833.4 | 0.1 | 774.0 | 0.1 | 633.8 | 0.1 |
| Chinese Taipei | 605.1 | 0.1 | | | | |

MITI (2015, 2017, 2018, 2019, 2020).
In Malaysia, there are promising opportunities for renewable energies (wind, hydro, solar) to produce and implement in different sectors with the industrial sector as well (Chua & Oh, 2012; Ong et al., 2011; Shafie et al., 2011). In this case, solar energy is more precious, and it has great potential than others due to the location of Malaysia which is near the equator (Fayaz et al., 2011; Izadyar et al., 2016; Jing et al., 2015). Solar radiation did abundantly throughout the year; an average sunshine duration is 12 h, and radiation is 18 MJ/m² which is equivalent to 5 kWh/m² (Louazene et al., 2013). However, the implementation and the utilization of renewable energy depend mainly on the government and the public of Malaysia. Also, the Malaysian government should have taken different policies to increase public awareness of the importance of renewable energy (Oh et al., 2010; Solangi et al., 2011).

### Health and Safety Issues

The complete pleasant state of physical, mental, and social is called health. The standard health of the people is related to the occupation in which they are engaged, and the performance of everyday occupations has a significant effect on daily life. Occupational health and safety are the integral components of the basic concepts of health, which is a part of social and economic development, and the occupation must be free from any kinds of hazardous, unpleasant, and accidental situations (Albert et al., 2014; Babel & Tiwari, 2014; Law et al., 1998). In the last decade, numerous pieces of literature have emphasized the significant contribution of occupational health and safety management (Bianchini et al., 2017; Fernández-Muñiz et al., 2009; Gopang et al., 2017; Jilcha & Kitaw, 2017; Kongtip et al., 2008; Mohammadfam et al., 2017; Nordlöf et al., 2017). Occupational health and safety management is the primary long-term strategy along with the application of different tools and systems which mitigate various work accidents and enhance health conditions at the workplace. Nowadays, these occupational health and safety systems not only comprise improvement in the occupational risk but also are active in ensuring the safety management practices within the company’s continuous assessment (Barten et al., 2008; Frick, 2011; Robson et al., 2007; Wachter & Yorio, 2014; Yorio et al., 2015). While the textile industry consists of various production units to convert textile fibers into clothing or finished textile materials, there are distinct health and safety issues affiliated with these textile industries (Saini, 2016; Singh, 2016). Table 7 shows the occupational diseases which should be seen in the textile and clothing industries.

In the working place, there are highly needed Organizational Health and Safety activities to save the employees from various hazardous situations (Malik et al., 2010). Organizational Health and Safety Management is a critical element of the textile and clothing industry to protect the organizational people (Ezema & Lemchi, 2015; Rashid & Rashid, 2015). It includes training and refreshing of the employee such as having to improve the worker’s awareness about using chemicals, dyes, and others; to teach them how to use and maintain personal protective equipment; and to

| Table 6 Average percentage of energy consumption for selection operation in the textile industry |
|-----------------------------------------------|
| Product | Process | Energy consumption (%) | Energy use |
| Spinning factory | Mixing/opening | 7.5 | Electricity |
| Carding | 8 |
| Combing | 5 |
| Drawing/roving | 4 |
| Ring spinning | 30 |
| Finishing | 6.5 |
| Air conditioning | 39 |
| Weaving operation | Woven fabric | 32 | Electricity and steam |
| Denim | 7 |
| Woven towels | 30 |
| Knitted | 30 |
| Dyeing and finishing | Filling and heating | 9 | Electricity and steam |
| Bleaching | 22 | Electricity |
| Washing | 41 | Electricity and steam |
| Dyeing | 16 |
| Softening | 12 |

BLU (2000); IEE (2006)
inform them about chemicals, dyes, and hazards, transportation, waste disposal, wearing signs, storage, and housekeeping rules (Cahn & Clifford, 2014; Soomro et al. 2015). Moreover, their regularity of salary, working hour, enough rest periods, medical and injury treatment centers, proper ventilation and adequate lighting, social security compensation, and labor union must be provided to them. However, to implement effective and sustainable organizational health and safety management, regular monitoring, measuring, and auditing are inevitable (Hiremath et al., 2014).

Performance in GDP of Malaysia

From the early 1970s, Malaysia embarked on export-oriented textile and clothing industrialization due to its quality, prompt supply, reliability, and capability to produce changeable fashionable garments (Plan, 2006). The textile and clothing industry is one of the most promising sectors in Malaysia. There is a vast opportunity to research the potentiality of textile industries in Malaysia which is also recognized by the Third Master Plan for future development (TESTEX AG, 2015). It has a maximum forecast of annual growth of export of around 7.8% per year. Moreover, in 2012 the textile and clothing sector contributed about 1.70% to the growth of GDP in the manufacturing industry in Malaysia (Hooi, 2016). The output of spinning, weaving, and the finishing of textiles was 11.6% and clothing by 13.5% in January–July 2013 (DOSM, 2013). The performance of textile and clothing is undoubtedly optimistic in 2014 (DOSM, 2015); the influence of the manufacturing sector on GDP for over 2 years is shown in Table 8. The growth rate and share percentage of manufacturing units that cover the textile and apparel sector are quite promising in the Malaysian economy. Furthermore, the recent influence of the textile sector which is included in the manufacturing sector in Malaysian GDP is neatly depicted in Fig. 6.

Fig. 5 Breakdown of standard electricity and thermal energy use in the composite textile plant. Source: Sathaye et al. (2005). a Standard electricity energy use. b Standard of thermal energy use

| Status | Motive | References |
|--------|--------|------------|
| Musculoskeletal disorder (MSD) includes tendonitis, osteoarthritis of the knees, trapezius spasm, trigger finger, carpal tunnel syndrome and back stain, etc | Force repetition lifting non-neutral postures Prolonged sitting | Ceresna-Chaturvedi (2015) |
| Asthma and respiratory problems | Fiber tints, dust, gases, vapors, chemical fumes, etc | Ahmed et al. (1998); Chaudhry, Ijaz, and Khan (2015); Jaiswal (2011) |
| Lung diseases | Bad insight air conditions | Subramani and Somasundaram (2015) |
| Cancer | Formaldehyde, dyes, azo dye, etc | Singh and Chadha (2016) |
| Skin disease | Various chemical usage, long time wetted skin, dyes, etc | Singh (2016); Subramani and Somasundaram (2015) |
| Ear disease and hearing loss | Heavy noise, prolonged sound | Mahmoud et al. (2004); Saramon (2014) |
Scenario Assessment

Like other countries, the manufacturing sector of Malaysia has an impact on the Malaysian economy; since the textile field is also included in the manufacturing sector, this sector is also directly effective on the Malaysian economy. The structure of Malaysian textile industries for both cotton and synthetic is like others’ textile industries (Fig. 2). However, synthetic fibers are predominantly produced in Malaysia and annually synthetic fiber production increased by about 4.3% significantly. Currently, textile industries in Malaysia are categorized into two streams, and now the current sector produces world-class products for world-renowned customers (Table 2). Moreover, Malaysian textile industries are mainly grouped into two types, namely, small and medium based on size (Fig. 3). Since cotton fiber production is marginal here, people would like to consume cotton fiber considerably (Table 3). As a result, human-made clothing production has increased simultaneously. Malaysian textile industries are now producing diversified classy products for sophisticated clients such as Nike, Ralph, Reebok, Adidas, Gucci, Gap, Puma, Calvin Klein, Walt Disney, Ashworth, Under Armour, and Uniqlo with great performance and confidence. Nowadays, they are producing various types of textiles such as fibers (cotton and synthetic), woven and knit fabrics, and carpets (Table 4) along with varied apparels such as skirts, t-shirts, gowns, trousers, vests, and coats (Table 4). Not only that but also Malaysian textile industries are now affecting the import and export trade of the Malaysian economy. Moreover, Malaysian textile is improving its share in the Malaysian export and import sectors day by day. Hence, Malaysian yarn, fabrics, and garments have been imported and exported to various countries such as China, Singapore, and Japan, influencing the Malaysian GDLP as well. As a consequence, the participation of textile and clothing in Malaysian GDP is also increasing surprisingly, and in 2014 it was 14.0 RM billion gross outputs.

In the case of energy usage, textile industries are the most energy-intensive, and the energy usage behavior of Malaysian textile industries shows a similar attitude. Most of the subsectors of textile processing units use electricity and thermal energy (Fig. 5). Due to the territorial position of Malaysia, it is very rich and full of available solar energy that could be used as an alternative energy source for Malaysian textile industries, since textile industries are the mostly utilized fossil energy to convert it into electricity and thermal energy to run the textile processes. Moreover, of late, health and safety issues are mainly considered the most paramount criteria due to the numerous sudden disasters in the security of factories. Currently, Malaysian textiles are also following and managing occupational health and safety criteria smoothly and properly. Nonetheless, health and safety issues are monitored; the workers are generally affected by several fatal diseases in textile factories (Table 7) such as cancer, lung problems, and skin and MSD, for countless reasons such as fiber tints, dust, gases, vapor, chemical fumes, bad insight air conditions, formaldehyde, dyes, and azo dye (Table 7). Therefore, the workplace needs to be quite safe and healthy. Besides, from the standpoint of Malaysian GDP, the textile sector has an impressive influence on it. The Third Master Plan of the Malaysian government for textile industries has played an effective role to contribute Malaysian GDP by which its consequences are quite an interesting output in total Malaysian GDP (Table 8). Several aspects can directly affect the Malaysian textile industries, which could be the most useful and profitable sides of Malaysia, and there is a huge possibility to flourish this sector here, according to the literature. The fundamental influential

| Economic activity | Malaysia % Growth | % Share |
|-------------------|------------------|--------|
| Agriculture       | 2.6 3.1          | 7.1 6.9|
| Mining            | 3.1 2.8          | 7.8 7.6|
| Construction      | 11.6 10.7        | 4.1 4.3|
| Manufacturing     | 6.2 5.5          | 25.0 25.1|
| Services          | 6.3 5.6          | 56.0 56.1|
| GDP/share         | 6.0 4.5–5.5      | 100.0 100.0|

Indicators (2015)

Fig. 6 Effect of textile and apparel sectors on Malaysian GDP. Source: DOSM (2022)
factors are GDP, product mix, raw materials, and types of customers portrayed in Fig. 7. Moreover, the literature stated that Malaysian authorities have a master plan to lift their textile sector progressively.

Challenges and Future Prospects

The principal raw material used in Malaysian textiles is synthetic and manmade fiber. Cotton, on the other hand, is the most extensively used fiber, and it is completely comfortable and hygienic, as most textiles and apparel are composed of cotton fibers (Alam & Ghosh, 2013). Malaysia does not manufacture cotton fiber, making the expansion of the textile sector a considerable challenge. The Malaysian government, on the other hand, can take a strong stand on the cotton import trading policy. The agriculturist and researcher may decide to investigate the feasibility of cotton farming in Malaysia. Malaysia’s textile industries are currently dealing with major global commodities and internal supply chain management crises (Lee, Udin, & Hassan, 2014). Through systematic operational management, it is critical to adopt and apply the right and flawless supply chain technology. This defect would not be reintroduced otherwise. Workers are another major challenge to the Malaysian textile sector. The existing textile and garment sectors are currently coping with this issue. Malaysia is a country with a low population density and a labor deficit. This issue should be solved by skilled employees migrating from other emerging countries. Although some businesses employ these migratory works, they are obtained from a variety of sources. Many concerns in textile industries can be established in this situation for moved and local workers, such as salary and payment issues, gender, forced labor, trade unions, and work legal status. Despite these obstacles, Malaysia has a fantastic opportunity to develop its textile sector (both upstream and downstream)—more here, particularly in industries dependent on synthetic fibers.

Conclusion

The current state of the textile industry was thoroughly examined to build large-scale textile industries in Malaysia. Textile structure, raw materials, energy utilization, end goods, health, and safety concerns, shearing in export and import, and contribution to the Malaysian GDP have all been thoroughly explored. This research can help you comprehend Malaysia’s textile industries and economy right away. Furthermore, according to the survey, cotton consumption in Malaysia has increased dramatically in recent years. Furthermore, Malaysian textile exports are expected to increase in 2021 compared to previous years, while textile imports have been relatively consistent in recent years. Furthermore, the growth rate of textile and clothing in the Malaysian GDP reached a high of 93.6% in 2021. Although the textile and garment business does not contribute significantly to the Malaysian economy, it has the potential to grow. In the future, the expansion of Malaysia’s textile industries will require quick research to overcome numerous challenges.

Abbreviations GDP: Gross Domestic Product; MIDA: Malaysian Investment Development Authority; MSD: Musculoskeletal Disorder; PRC: People’s Republic of China; RM: Malaysian Ringgit; USD: United States of America; WTO: World Trade Organization

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Data Availability Data sharing does not apply to this article as no datasets were generated or analyzed during the current study.

Declarations

Conflict of Interest The authors declare no competing interests.
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