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Production and Export of Technical Textiles: Harnessing the Potential in Pakistan

A baseline study to map technical textile value chain in Pakistan; diagnosis, road mapping and recommendation for improvement.



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Production and Export of Technical Textiles: Harnessing the Potential in Pakistan

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CONTENTS

Executive Summary	XV
Background and Scope of the Study	16
Research Methodology	16
1. Global Textile	18
1.1 Existing Conventional Textile Value Chain In Pakistan	19
1.2 Status of Pakistan's exports	25
1.3 Summary of Pakistan's exports and findings	42
2. Technical Textile	45
2.1 Classification of technical textile with respect to area of application	45
2.2 Classification of technical textile with respect to technology	48
2.3 Global technical textile market	50
2.4 Pakistan's technical textile market building blocks	53
2.5 Stakeholders of technical textile market in Pakistan	54
2.6 Pakistan's technical textiles value chain (process wise) mapping	54
2.7 Educational and technical textile research institutes	60
2.8 Ministry of Commerce and Textile Policies	61
2.9 Testing of technical textiles	62
2.10 Textile associations	64
2.11 Trade analysis of technical textiles	64
2.12 Major findings	104
3. SWOT Analysis of Pakistan's Technical Textiles Value Chain	108
3.1 Strengths	108
3.2 Weaknesses	109
3.3 Opportunities	110
3.4 Threats	110
3.5 Findings of the SWOT analysis	112
3.7 Regional and international success stories	116
3.8 Proposed technical assistance interventions in future	117
References	118

LIST OF FIGURES

Figure 1: Top textile and clothing exporters in the world ⁽²⁾	18
Figure 2: Top textile and clothing importers in the world ⁽²⁾	19
Figure 3: World cotton production in 2018/19 ⁽⁵⁾	20
Figure 4: Cotton production and consumption in Pakistan from 1960 to 2020 ⁽²⁾	20
Figure 5: Top textile and clothing export destinations for Pakistan ⁽²⁾	25
Figure 6: Top textile and clothing importing countries for Pakistan (2018) ⁽²⁾	26
Figure 7: Total and textile exports of Pakistan from 2009-19 ⁽²⁾	27
Figure 8: Comparison in growth of textile exports of Pakistan with regional countries ⁽²⁾	27
Figure 9: Breakdown of total exports of Pakistan in 2019 ⁽²⁾	28
Figure 10: Variation in four top textile exports product groups of Pakistan from 2009-19 ⁽²⁾	29
Figure 11: Top exporter countries of made ups (HS code 63) in 2019 ⁽²⁾	29
Figure 12: Comparison of made ups (HS code 63) exports from 2009-19 ⁽²⁾	30
Figure 13: Breakdown of made ups (HS Code 63) exports of Pakistan in 2019 ⁽²⁾	31
Figure 14: Growth in Pakistan's exports of different articles (HS Code 63) during 2009-19 ⁽²⁾	31
Figure 15: Made ups (HS Code 63) export destinations of Pakistan in 2019 ⁽²⁾	32
Figure 16: Top exporter countries of cotton products (HS code 52) in 2019 in the world ⁽²⁾	33
Figure 17: Breakdown of cotton (HS code 52) group exports of Pakistan in 2019 ⁽²⁾	33
Figure 18: Growth in Pakistan's exports of different articles (HS code 52) during 2009-19 ⁽²⁾	34
Figure 19: Cotton (HS code 52) export destinations of Pakistan in 2019 ⁽²⁾	34
Figure 20: Top exporter countries of apparels and clothing knitted or crocheted (HS code 61) in 2019 in the world ⁽²⁾	35
Figure 21: Country wise export trend of apparel and clothing knitted or crocheted (HS code 61) in 2010-19 in the world ⁽²⁾	36
Figure 22: Country wise export trend of apparel and clothing knitted or crocheted (HS code 61) in 2010-19 in the world ⁽²⁾	37
Figure 23: Breakdown of made ups (HS Code 63) exports of Pakistan in 2019 ⁽²⁾	37
Figure 24: Growth in Pakistan's exports of different articles (HS Code 61) during 2009-19 ⁽²⁾	38
Figure 25: Articles of knitted apparel and clothing (HS Code 61) export destinations of Pakistan in 2019 ⁽²⁾	38
Figure 26: Top exporter countries of apparel and clothing, not knitted or crocheted (HS code 62) in 2019 in the world ⁽²⁾	39
Figure 27: Country wise export trend of apparel and clothing not knitted or crocheted (HS code 62) in 2010-19 in the world ⁽²⁾	40
Figure 28: Growth in Pakistan's exports of different articles (HS code 62) during 2009-19 ⁽²⁾	40
Figure 29: Article of apparel and clothing, not knitted or crocheted, (HS code 62) export destinations of Pakistan in 2019 ⁽²⁾	41
Figure 30: Export potential map of Pakistan for textile products ⁽²⁾	44
Figure 31: Classification of technical textile with respect to application	45
Figure 32: Examples of application of technical textiles	47
Figure 33: Technical textile value chain from materials to end products ⁽²⁸⁾	48
Figure 34: Category wise breakdown (value in billion US\$) of the global technical textiles market ⁽²⁾	50
Figure 35: Application segment wise breakdown (%) of global technical textiles market ⁽²⁾	51
Figure 36: Category-wise (%) of global technical textiles market ⁽²⁾	52
Figure 37: Region-wise breakdown (%) of global technical textiles market ⁽²⁾	52
Figure 38: Building blocks of technical textiles market in Pakistan	53
Figure 39: Technical textiles stakeholders in Pakistan	54
Figure 40: Technical Textile Manufacturing Value Chain in Pakistan	55

Figure 41: A detailed value chain map of woven/knitted technical textile manufacturing in Pakistan	55
Figure 42: Location of technical textile industry in different regions in Pakistan ⁽²⁾	55
Figure 43: Global consumption of fibre for technical textiles ⁽²⁾	56
Figure 44: Nonwoven manufacturing lines installed in Pakistan and their capacity (tonnes)	60
Figure 45: Pakistan's agrotech export (thousand US\$) to world ⁽²⁾	66
Figure 46: Pakistan's agrotech import (million US\$) from the world, product wise breakdown ⁽²⁾	67
Figure 47: Pakistan's agrotech export and imports (thousand US\$) comparison (2015-19) ⁽²⁾	67
Figure 48: Pakistan's buildtech export (million US\$) to world ⁽²⁾	69
Figure 49: Pakistan's buildtech exports (million US\$) to world, product wise breakdown ⁽²⁾	70
Figure 50: Pakistan's builtech exports and imports (thousand US\$) comparison (2015-19) ⁽²⁾	70
Figure 51: Pakistan's clothtech export (million US\$) to world, country wise breakdown ⁽²⁾	71
Figure 52: Pakistan's clothtech export (million US\$) to world, product wise breakdown ⁽²⁾	72
Figure 53: Pakistan's clothtech import (million US\$) from world, product wise breakdown ⁽²⁾	72
Figure 54: Pakistan's clothtech exports and imports (thousand US\$) comparison (2015-19) ⁽²⁾	73
Figure 55: Countries from which Pakistan is importing mobiltech (million US\$) ⁽²⁾	76
Figure 56: Pakistan's mobiltech import (million US\$) from world, product wise breakdown ⁽²⁾	77
Figure 57: Pakistan's mobiltech export and import (thousand US\$) comparison (2015-19) ⁽²⁾	77
Figure 58: Pakistan's oekotech export and import (thousand US\$) comparison (2015-19) ⁽²⁾	78
Figure 59: Pakistan's packtech export (million US\$) to world, country wise breakdown ⁽²⁾	80
Figure 60: Pakistan's Packtech exports and imports (thousand US\$) comparison (2015-19) ⁽²⁾	81
Figure 61: Pakistan's indutech import (million US\$) from the world, product wise breakdown ⁽²⁾	82
Figure 62: Pakistan's medtech export (million US\$) to the world, country wise breakdown ⁽²⁾	84
Figure 63: Pakistan's medtech exports (million US\$) to the world, product wise breakdown ⁽²⁾	85
Figure 64: Pakistan's medtech import (million US\$) from the world, country wise breakdown ⁽²⁾	86
Figure 65: Pakistan's medtech import (million US\$) from the world, product wise breakdown	86
Figure 66: Pakistan's medtech export and import (thousand US\$) comparison (2015-19) ⁽²⁾	87
Figure 67: Pakistan's protech export (million US\$) to the world, country wise breakdown ⁽²⁾	88
Figure 68: Pakistan's protech export versus import (thousand US\$) comparison (2015-19) ⁽²⁾	89
Figure 69: Pakistan's sportech export (million US\$) to the world, country wise breakdown	91
Figure 70: Pakistan's sportech export (million US\$) to the world, product wise breakdown	91
Figure 71: Pakistan's sportech export and import (thousand US\$) comparison (2015-19) ⁽²⁾	92
Figure 72: Pakistan's technical fiber import (million US\$) from the world, country wise breakdown ⁽²⁾	94
Figure 73: Pakistan's technical fiber import (million US\$) from the world, product wise breakdown ⁽²⁾	95
Figure 74: Pakistan's technical fiber import (thousand US\$) and exports comparison (2015-19) ⁽²⁾	96
Figure 75: Pakistan's technical yarn import (million US\$) from the world, country wise breakdown ⁽²⁾	98
Figure 76: Pakistan's technical yarn import (million US\$) from the world, product wise breakdown ⁽²⁾	99
Figure 77: Pakistan's technical yarn import (thousand US\$) and exports comparison (2015-19) ⁽²⁾	99
Figure 78: Pakistan's technical fabric exports (million US\$) to the world, country wise breakdown ⁽²⁾	101
Figure 79: Pakistan's technical fabric exports (million US\$) to the world, product wise breakdown ⁽²⁾	102
Figure 80: Pakistan's technical fabric imports (million US\$) from the world, country wise breakdown ⁽²⁾	102
Figure 81: Pakistan's technical fabric imports (million US\$) from the world, product wise breakdown ⁽²⁾	103
Figure 82: Pakistan's technical fabric import and export (thousand US\$) from the world, product wise breakdown ⁽²⁾	103
Figure 83: Pakistan's technical textile exports (thousand US\$) and imports comparison ⁽²⁾	104
Figure 84: Pakistan's category wise technical textiles export (thousand US\$) (2015-19) ⁽²⁾	105
Figure 85: Pakistan's category wise technical textile imports (thousand US\$) (2015-19) ⁽²⁾	106

LIST OF TABLES

Table 1: Name and capacity of jute mills currently operational in Pakistan ⁽¹³⁾	21
Table 2: Fibre consumption in million bales ⁽¹⁶⁾	23
Table 3: Installed capacity and production of spinning ⁽¹⁶⁾	23
Table 4: Installed capacity of weaving looms ⁽¹⁶⁾	24
Table 5: Summary of Pakistan's textile exports (top HS codes) ⁽²⁾	42
Table 6: Summary of Pakistan's textile exports (top products) ⁽²⁾	43
Table 7: Global market drivers for technical textiles	53
Table 8: Properties of natural fibres ⁽²³⁾	57
Table 9: Use of fibres in technical textiles ⁽²⁾	58
Table 10: Local production in Pakistan and staple fibre import in 2019 ⁽²⁾	58
Table 11: Process wise mapping of technical textile value chain in Pakistan	59
Table 12: Composite industry of Pakistan	59
Table 13: Major tests and test standard required for testing of technical textiles ⁽²⁶⁾	63
Table 14: Category wise global market of technical textiles and Pakistan's exports and imports in 2019 ⁽²⁾	65
Table 15: Global market of technical fibers, yarns and fabrics and Pakistan's exports and imports in 2019 ⁽²⁾	65
Table 16: HS codes of main products included in Agrotech category	66
Table 17: HS codes of main products included in buildtech category	68
Table 18: HS Codes of main products included in clothtech category	71
Table 19: HS Codes of main products included in mobiltech category	74
Table 20: HS codes of main products included in oekotech category	78
Table 21: HS codes of main products included in packtech category	79
Table 22: HS codes of the main products included in the indutech category	82
Table 23: HS codes of main products included in medtech category	83
Table 24: HS codes of the main products included in protech category	88
Table 25: HS codes of main products included in sportech category	90
Table 26: HS Codes of main products included in the technical fibers category	93
Table 27: HS Codes of main products included in technical yarns category	97
Table 28: HS codes of main products included in technical fabrics category	100
Table 29: Global technical textile market in thousand US\$ (top 15 products) ⁽²⁾	107
Table 30: Technical textile exports in thousand US\$ by Pakistan (top 10 products) ⁽²⁾	107
Table 31: Technical textile imports in thousand US\$ by Pakistan (top 10 products) ⁽²⁾	107
Table 32: Summary of SWOT Analysis	112
Table 33: Required interventions for technical textiles value chain in Pakistan	114

EXECUTIVE SUMMARY

Textile is the biggest industrial sector in Pakistan, which contributes 58 per cent of exports, 8.5 per cent to the GDP and 45 per cent to the total employment in the country. After Bangladesh, Pakistan is the second most dependent country on textile with respect to exports. During the last ten years, the growth in Pakistan's textile exports was 2 per cent which is quite low in comparison to other regional countries. During the same period, the textile exports of Bangladesh (US\$36.6 billion) increased by 177 per cent, Viet Nam (US\$36.16 billion) by 256 per cent, India (US\$37.01 billion) by 64 per cent and China (US\$266.5 billion) by 48 per cent. The slow growth in the textile sector is impacting the overall exports, current account deficit and new employment generation as well.

As per International Trade Center's (ITC) export potential map, Pakistan has an untapped export potential of US\$12.2 billion out of which untapped export potential of textile and clothing is about US\$7 billion. Pakistan's textile and clothing export product range is very narrow, and 97 per cent of the textile exports are only in four product groups. In the biggest export categories (HS code 61 and 62 worth US\$474 billion), Pakistan's position is 18th and 17th (with a share of US\$5.4 billion) respectively as an exporter. Pakistan's exports are mainly concentrated to USA (22 per cent) and the European Union (>40 per cent), while no exports to markets such as Japan, Russia, Korea, Mexico, and Switzerland which are importing more than US\$100 billion of textiles and clothing.

Pakistan is ranked at 107th position among the 140 countries in the global competitiveness index and at 125th in the category of human skills. Besides this, the subcategories of human skills do not have satisfactory values that include quality of vocational training (90th), skill set of graduates (51st), and ease of finding skilled employees (63rd) etc.

Technical textile is performance textiles with an emerging market of US\$200 billion. The share of technical textiles in Pakistan's export is about 0.3 per cent against 2.4 per cent share in export of conventional textiles.

The technical textile industry is one of the fastest growing industries in the world. It is a highly innovative and versatile industry, serving a wide range of end markets with less competition and higher added value compared to the conventional textiles. These attributes have led many countries to shift their textile industry from conventional to technical.

This study, the first of its kind conducted in Pakistan, aims to map existing technical textile value chain in Pakistan, identify strengths, weaknesses, opportunities and strengths and road mapping for enhancing exports.

The first part of the study focuses on conventional textiles. Existing conventional textile value chain in Pakistan is reviewed, followed by a detailed analysis and findings regarding Pakistan's exports. The second part of the study focuses on technical textiles, their classification, global technical textile market and global market drivers. Then Pakistan's technical textile market is discussed in detail. This includes identification of stakeholder of technical textile market in Pakistan, technical textiles value chain (process wise) mapping, list and capacity of educational and technical textile research institutes, testing methods and testing bodies. Global and Pakistan's trade analysis in the domain of technical textiles for each of the 12 categories is discussed, followed by trade analysis of technical fibres, technical yarns and technical fabrics. Major findings are divided into two parts, namely, category wise and product wise. Opportunities for localization and export enhancement are enlisted and discussed in detail. SWOT analysis of Pakistan's technical textiles value chain is presented followed by major findings, recommendations and required interventions. The study concludes with examples of regional and international success stories and proposed technical assistance interventions in the future.

Background and Scope of the Study

This study is a part of the WWF-Pakistan's project, International Labour and Environmental Standards Application in Pakistan's SMEs (ILES), funded by the European Union, and implemented in collaboration with the International Labor Organization (ILO).

The objectives of the study include:

- a) To explore and outline the existing opportunities and capabilities of producing technical textiles in Pakistan for international markets with available raw material base (cotton and polyester) and infrastructure.
- b) To frame the recommendations for broadening and upgrading the raw material base and infrastructure (machinery and technology) necessary to overcome the limitations in existing Pakistan textile setups to produce technical textiles for increased exports.

The main tasks include:

1. Key stakeholder mapping for technical textiles
2. Assessment of existing raw material base for cotton; Purified Terephthalic Acid and polyester
3. Assessment of infrastructure for ginning, spinning, weaving, processing and garmenting
4. Pakistan's technical textiles value chain mapping and SWOT analysis
5. Global market of technical textiles and Pakistan's contribution in import and export
6. Trade analysis of technical textiles and key end user products
7. Key limitations for not entering in the technical textile market
8. Exploration of opportunities for technical textile production in Pakistan with existing limitations
9. Regional and international best practices and success stories which can be replicated in Pakistan
10. Short term, medium term and long term measures for overcoming the impediments in producing and marketing technical textiles in global markets.



Research Methodology

This was the first study conducted on the technical textile sector in Pakistan, therefore, there were challenges in accurately analyzing and assessing the technical textile value chain of Pakistan due to the scarcity of data and secrecy of the sector. To meet those challenges, several steps were taken. The methodology is similar to that adopted in the value chain mapping of Egyptian technical textile industry ⁽¹⁾.

In the first step, the existing value chain, from fibre to finished products, of the conventional textile industry was assessed. Current state, strengths, weaknesses, and recommendations for improvement of the existing industry were prepared.

The second step consisted of mapping the technical value chain of textiles from raw material suppliers, producers and processors to final markets. This mapping included various actors, such as service providers, services, organizations, and other supporting segments. Profiles of companies and organizations were collected from industry directories, web pages, surveys, Textile Commissioner's Offices (TCO), and other sources.

The third stage consisted of defining the technical textile industry itself. This was done by dividing the sector, according to the various steps of the value chain (for example, upstream from technical fibres, yarns and fabrics and downstream to technical textile end-products). The end-products were classified using the categories used by the Frankfurt GmbH Techtexil and as mentioned in fibres for technical textiles, the leading international trade exhibition for technical textiles.

In the fourth step, Harmonized System (HS) codes related to technical textiles were identified and then the import and export

data for these HS codes over a five-year period (2015 to 2019) was gathered. The data was plotted to show imports and export trends for the given period, and the trade balance was illustrated to define the trade surplus and deficit in technical textile articles.

Trade data were collected from a range of sources, including the TCO, Federal Bureau of Statistics, World Trade Organization (WTO), International Trade Centre (ITC) and UN Comtrade.

Subsequently, various members of the value chain were identified and surveys/interviews were conducted to analyze the strengths, weaknesses, opportunities, and threats related to technical textile value chains in Pakistan. The analysis and interpretation of the results are based on the surveys, interviews, and experience of the researchers.

1 GLOBAL TEXTILE

In 2019, goods worth US\$18,754 billion were traded globally, out of which US\$978 billion was trade of textile goods. The top textile and clothing exporters in the world are shown in Figure 1. China is the top exporter with US\$211 billion exports of textile and clothing, whereas Pakistan remains at the tenth place, with US\$14.53 billion of textile and clothing exports.

Figure 1. Top textile and clothing exporters in the world ⁽²⁾

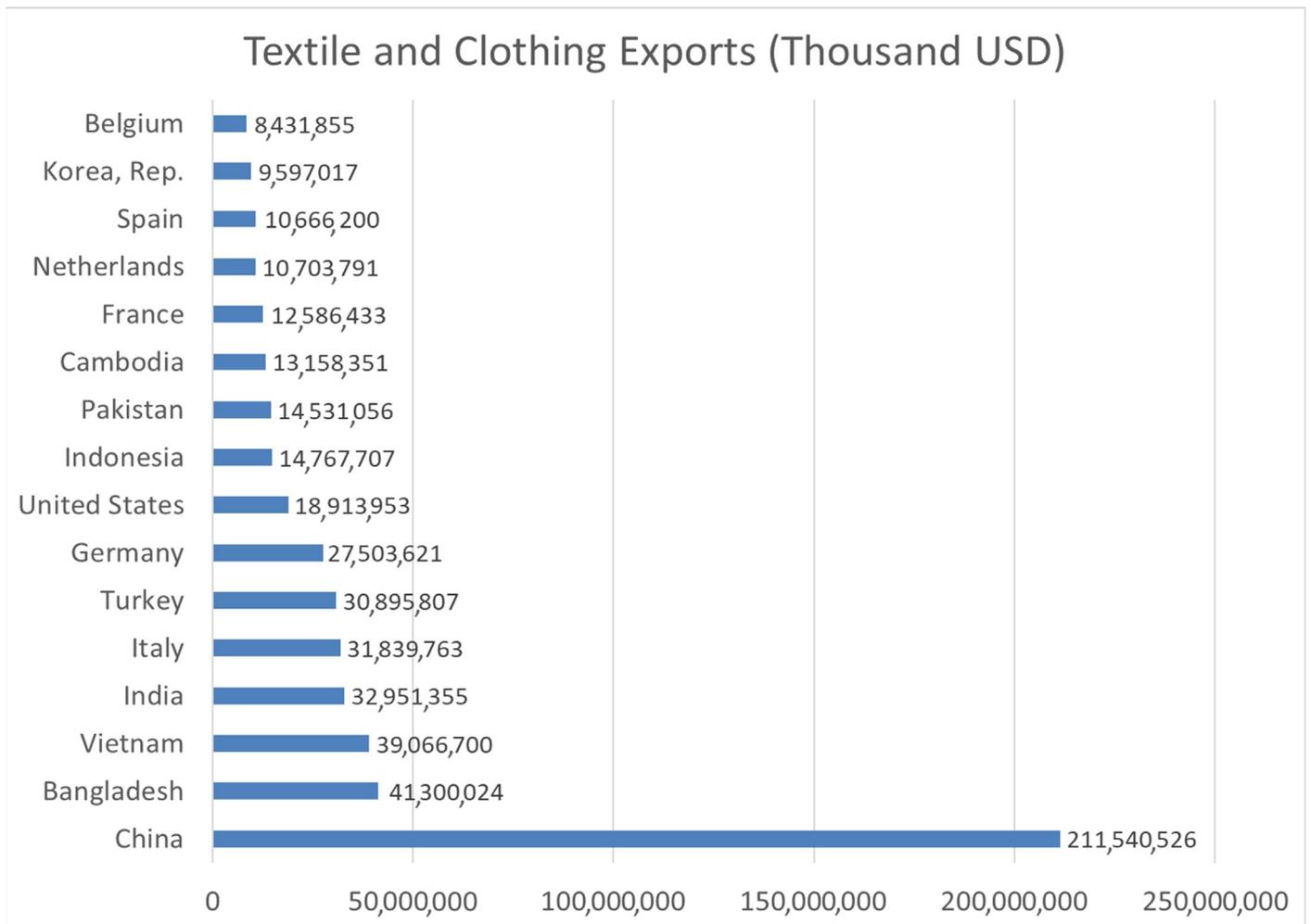
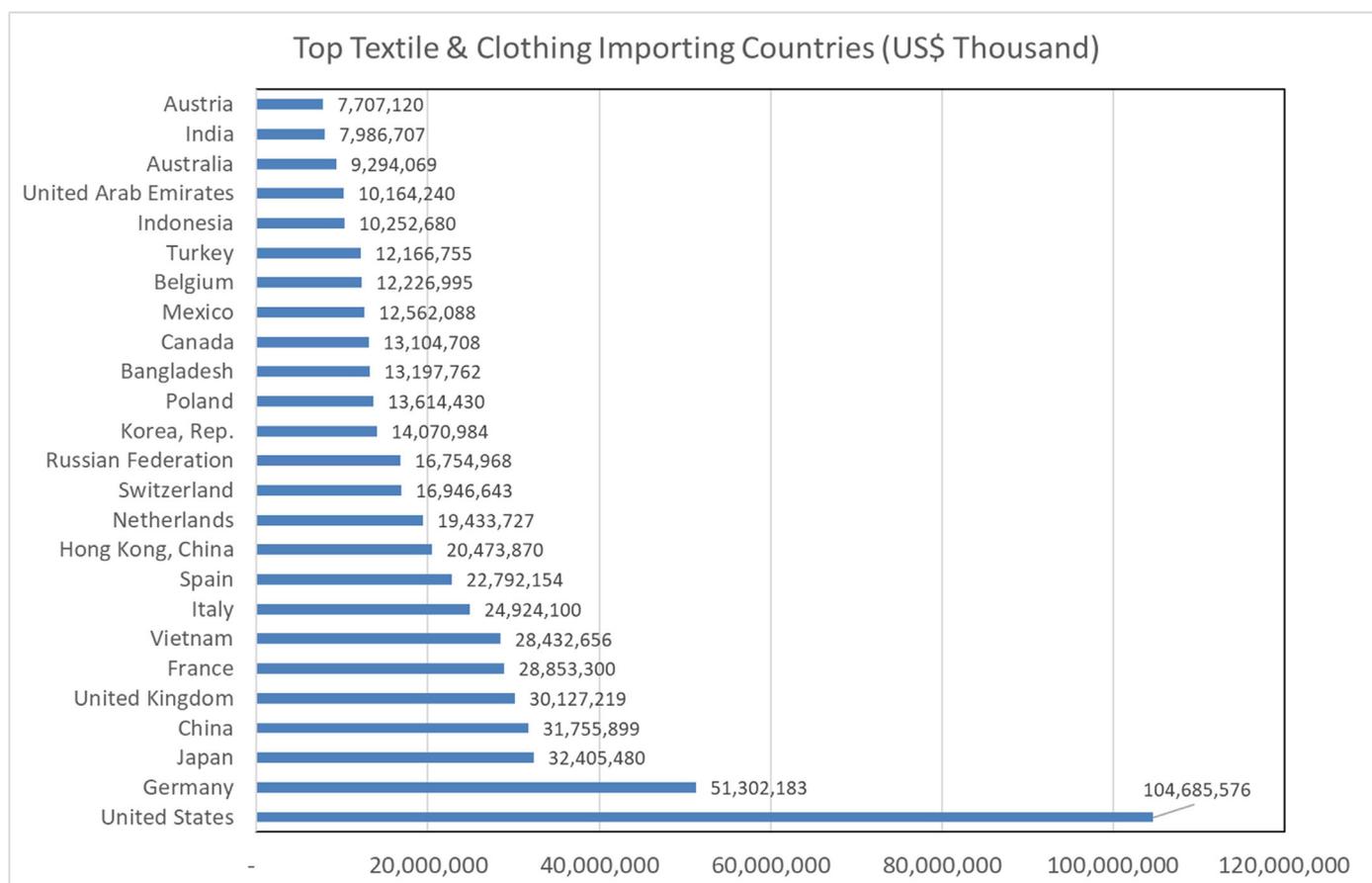


Figure 2 shows the leading textile and clothing importers in the world. The United States stands first in the world with US\$104 billion imports of textile and clothing followed by Germany, Japan, China and the United Kingdom. Despite being an agricultural and textile focused country, Pakistan also imports textile and clothing worth US\$3.8 billion.

The United States stands first in the world with US\$104 billion imports of textile and clothing

Figure 2. Top textile and clothing importers in the world ⁽²⁾



1.1 EXISTING CONVENTIONAL TEXTILE VALUE CHAIN IN PAKISTAN

Pakistan is the 5th largest producer of cotton and the conventional textile value chain comprises of the following different sectors:

1. Fibres (farming/production)
2. Ginning
3. Spinning
4. Weaving
5. Hosiery/knitting
6. Textile wet processing
7. Made ups
8. Garments
9. Denim
10. Composite units

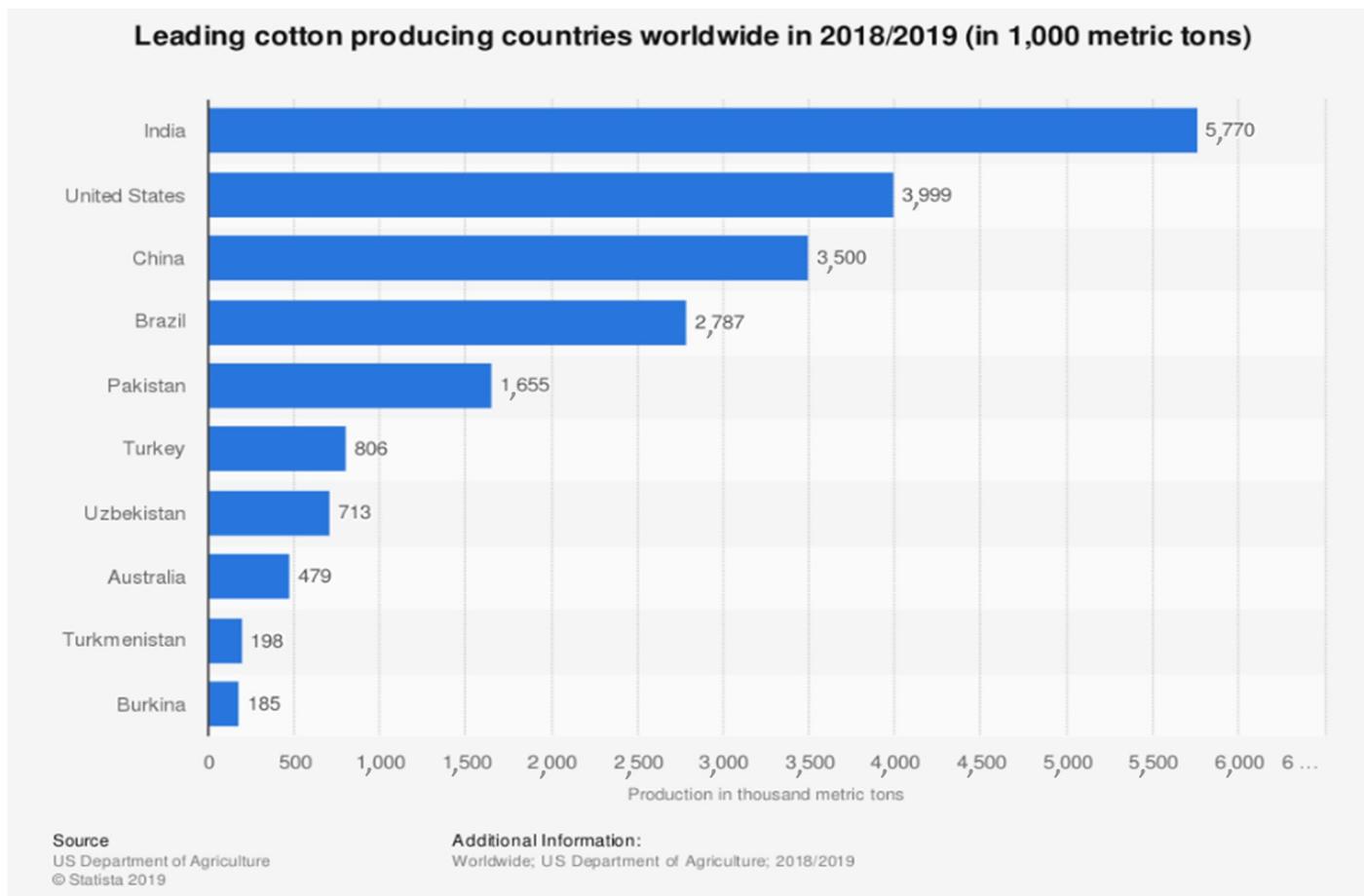
1.1.1 Fibres (Farming/Production)

Fibres for textile industry of Pakistan are either grown (natural fibres) or are man-made (synthetic). In terms of fiber utilization from plants, there is potential in Pakistan for cotton, jute, flax, sisal and banana etc. as these are grown indigenously. However, currently only cotton and jute are being used.

1.1.1.1 Cotton

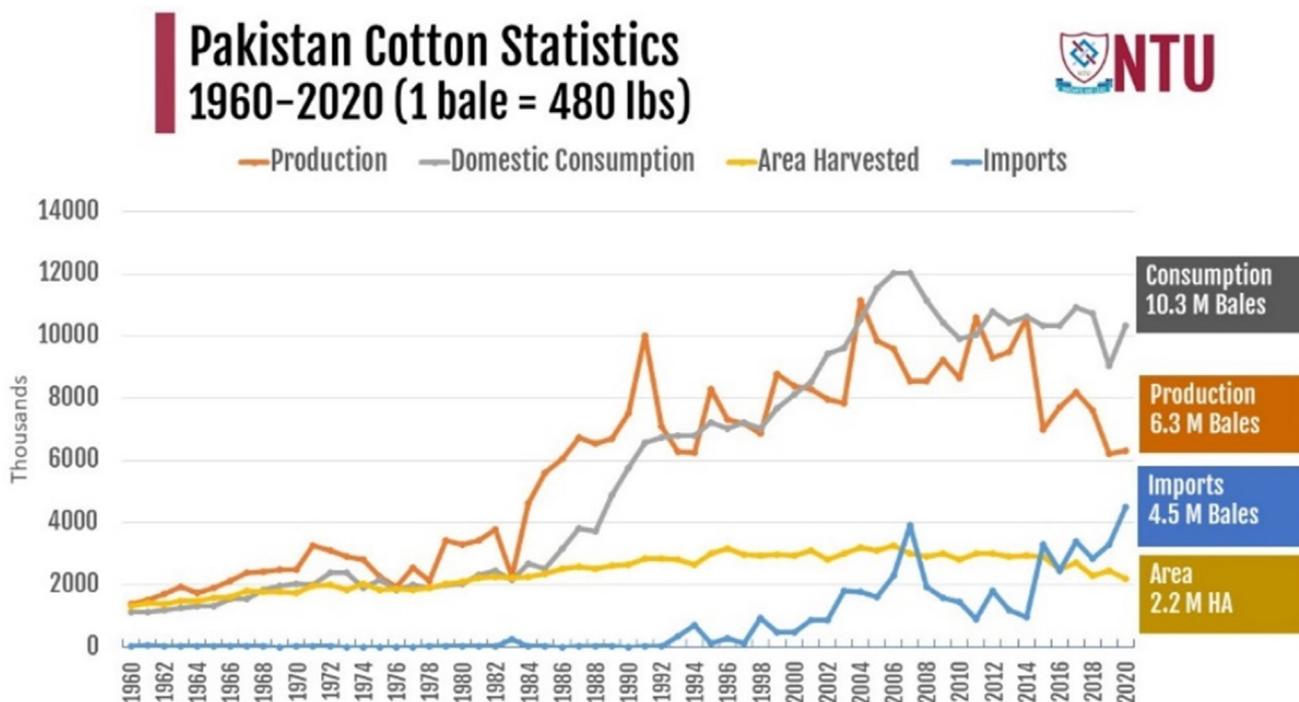
Cotton is a major crop in Pakistan with an annual production of 1.655 million metric tons. As shown in the Figure 3, Pakistan is the fifth largest producer of cotton in the world. The cotton fibre is the most utilized fibre due to its comfort, durability and ease to process ⁽³⁾. Pakistan is also among the top producers and consumers of the cotton ⁽⁴⁾.

Figure 3. World cotton production in 2018/19 ⁽⁵⁾



The cotton crop, which is cultivated in large area in Pakistan, consumes very high amount of water. The growing of cotton also requires the bulk of pesticides. Cotton is cultivated only on 2.4 per cent of arable land in the world which consumes nearly 11 per cent of the world’s pesticides. The usage of pesticides on cotton crop is around 50 per cent of total pesticides in developing countries like Pakistan and India⁽⁵⁾. Moreover, the high cost of growing, processing and a big gap in demand and supply make the cotton products highly expensive. These drawbacks urge the usage of other natural fibres to produce fabrics with qualities that are comparable to cotton.

Figure 4. Cotton production and consumption in Pakistan from 1960 to 2020 ⁽²⁾



Cotton production, area harvested, imports and consumption (million bales) of Pakistan during 1960-2020 is shown in Figure 4. During the last decade, despite a continuous and stable demand of cotton, the production decreased. Quality of seed, rise in sugarcane production in cotton belt and natural disasters etc. are among the reasons for this decrease. The cotton produced is not enough to meet the quantity and quality required by the textile industry in Pakistan. Therefore, Pakistan was the seventh largest importer of cotton in 2019, importing about 418 metric tonnes of cotton spending US\$710 million ⁽⁵⁾.

The sisal, banana, flax and jute fibres included in the category of natural fibres, are getting attention due to the lesser usage of water, herbicides, pesticides and favorable properties as compared to cotton ⁽⁶⁻⁸⁾.

Sisal fibres are extracted from leaves of plants which have good dimensional stability. These fibres are used to prepare clothing, handbags, carpets and ropes ^(3,9). Banana fibres are another class of natural fibres which has huge potential to replace conventionally used natural fibres. Banana is the fourth largest crop of the world, and stems are used to extract the fibres. The banana fibres is highly comfortable and is used to prepare light weight clothing, hats and scarves. Moreover, these fibres are also used in producing paper, tea bags and for car interiors ^(3,10). Flax fibres are also extracted from the stems of the plants which produce ideal fabrics for hot weather. These are also used to produce mesh for erosion control along the roads, buildings and canals ^(11,12).

The sisal, banana, flax and jute fibres are cultivated in Pakistan, but they are not used in producing high value fabrics. The banana crop is cultivated over an area of 35,000 hectares, which produces more than 7 million tonnes stem waste ⁽²⁾. This waste can be processed into valuable products to increase exports. Sindh and Potohar are ideal to grow banana crop where barren land can be used for banana cultivation.

1.1.1.2 Jute

The cultivation area of jute is less than 20 hectares and based mainly in south Punjab. There are 14 reported mills of jute in Pakistan out of which five are operational currently. Pakistan Jute Mills Association (PJMA) with 10 members is the representative body of jute manufacturers. Five major jute mills and their production capacities are given in Table 1:

Table 1. Name and capacity of jute mills currently operational in Pakistan ⁽¹³⁾

Sr.	Name of the mill	Capacity (metric tons)
1	Thal Limited	33000
2	Sargodha Jute Mills	30500
3	Indus Jute Mills	20000
4	White Pearl Jute Mills	15000
5	Madina Jute Mills	15000

Based on actual capacity utilization, Sargodha Jute Mill is the largest producer of jute products. Most of the jute fibre for the said mills is imported from Bangladesh. In 2019, Pakistan imported 40,830 tonnes of jute, mainly from Bangladesh that costs US\$23.61 million. The imported quantity was double in 2018 ⁽¹³⁾.

There are 14 reported mills of jute in Pakistan out of which five are operational currently.

1.1.1.3 Flax

Flax, a bast fibre mainly grown in Europe, is used in clothing due to its lustrous nature, soft feel and superior mechanical properties. It is also one of the main candidates for replacement of synthetic fibres in technical textiles and composites. In Pakistan flax crop is grown mainly for obtaining linseed and linseed oil. Therefore, for in-house use in textiles, flax fibres are imported. In 2019, Pakistan imported 649 tonnes of flax fibres worth US\$1.765 million ⁽¹⁴⁾.

1.1.1.4 Wool

There are 29.4 million sheep across the country which yield 44.1 million kg of wool. Out of these 29.4 million, more than 14.1 million (48 per cent) sheep population is found in Balochistan. Pakistan is a net importer of wool (code 51), and it imported wool articles worth US\$10.5 million in 2019 ⁽¹⁴⁾. The maximum value of wool imports was in 2017 worth US\$21 million.

1.1.1.5 Man-made fibres

Currently, three polyester units are functioning in Pakistan; Ibrahim Fibres, ICI Pakistan and Rupali Polyester with an installed capacity of 390,600, 126,853 and 23,725 tonnes per annum respectively ⁽¹⁵⁾. Pakistan imports polyester, nylon, acrylic, viscos, glass, carbon and aramid fibres. In 2019, Pakistan imported man-made fibres worth US\$603 million with China as the biggest market share holder. At the same time, Pakistan exported these fibres with a value of US\$313 million ⁽¹⁵⁾.

1.1.2 Ginning

Ginning is the process of removing seeds and waste from the picked cotton. Currently, there are nearly 1,200 ginning factories in the country: 250 in Sindh and more than 720 in Punjab, with the others in Balochistan. These factories handle Pakistan's cotton crop, which is estimated to be more than eight million bales this year ⁽¹³⁾.



1.1.3 Spinning

The spinning industry is the largest textile industry sector in Pakistan with 511 mills having an installed capacity of 13.36 million spindles and 199,000 rotors ⁽¹⁶⁾. The industry is mainly focused on spinning of coarse and medium fineness yarns. The fibre consumption by Pakistan's spinning industry and installed capacity is given in table 2 and table 3 respectively.

Table 2. Fibre consumption in million bales ⁽¹⁶⁾

	FY16	FY17	FY18
Raw Cotton	1.1	1.1	1.0
Manmade fibers	0.4	0.4	0.4
Total fibers consumed	1.5	1.5	1.4

Table 3. Installed capacity and production of spinning ⁽¹⁶⁾

CAPACITY	2015-16	2016-17	2017-18	2018-19
Spindles (Millions)	13,414	13,414	13,410	13,409
Rotors	187,259	198,801	198,801	198,801
Yarn Production (M. Kgs)	3,397.3	3,428.1	3,430.1	3,431.2

The spinning industry is mainly installed in Punjab and Sindh province.

1.1.4 Weaving

The weaving industry is divided into two sub-sectors, organized mill sector and unorganized mill sector. The unorganized mill sector roughly accounts for 90 per cent of the total weaving capacity. No conclusive figures are available on the share of each of these sub-sectors in the total weaving industry. In the organized mill sector, air jet looms are the most used looms.

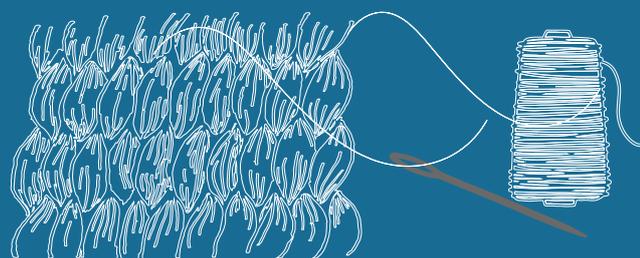
1.1.4.1 Breakdown of looms

The known installed capacity of weaving looms in Pakistan is given in table 4.

Table 4. Installed capacity of weaving looms ⁽¹⁶⁾

CAPACITY	2015-16	2016-17	2017-18	2018-19
Looms (Mill Sector)	8,188	9,084	9,084	9,084
Shuttle less	28,500	28,500	28,500	28,500
Power looms	375,000	375,000	375,000	375,000
Looms Total	411,688	412,584	412,584	412,583
Cloth Production: (M. Sq. mtrs)				
Mill Sector	1,039.1	1,043.3	1,043.7	1,046.0
Non-Mill Sector	8,120.1	8,126.4	8,127.2	8,128.8
Total	9,159.2	9,169.7	9,170.9	9,147.8

- Weaving looms, both in organized and unorganized sector lack capacity to convert all the yarn produced in spinning mills into fibre/ cloth.
- The weaving sector is primarily unorganized.
- “Power looms” have the largest share of output in cloth making.



In addition to these, there are about 150,000 power looms installed mainly in the Punjab province (Faisalabad and Multan).

1.1.4.2 Textile wet processing

There are about 106 finishing units in the organized sector and 625 finishing units in the small-scale sector with a total finishing capacity of 4 billion square metres ⁽¹⁶⁾.

1.1.4.3 Knitwear industry

The installed capacity for Pakistani knitwear manufacturers numbered 12,000 machines ⁽¹⁶⁾.

1.1.4.4 Garments industry

Regarding finished textile goods, the country's 5,000 apparel units featured about 700,000 industrial and domestic stitching machines ⁽¹⁷⁾.

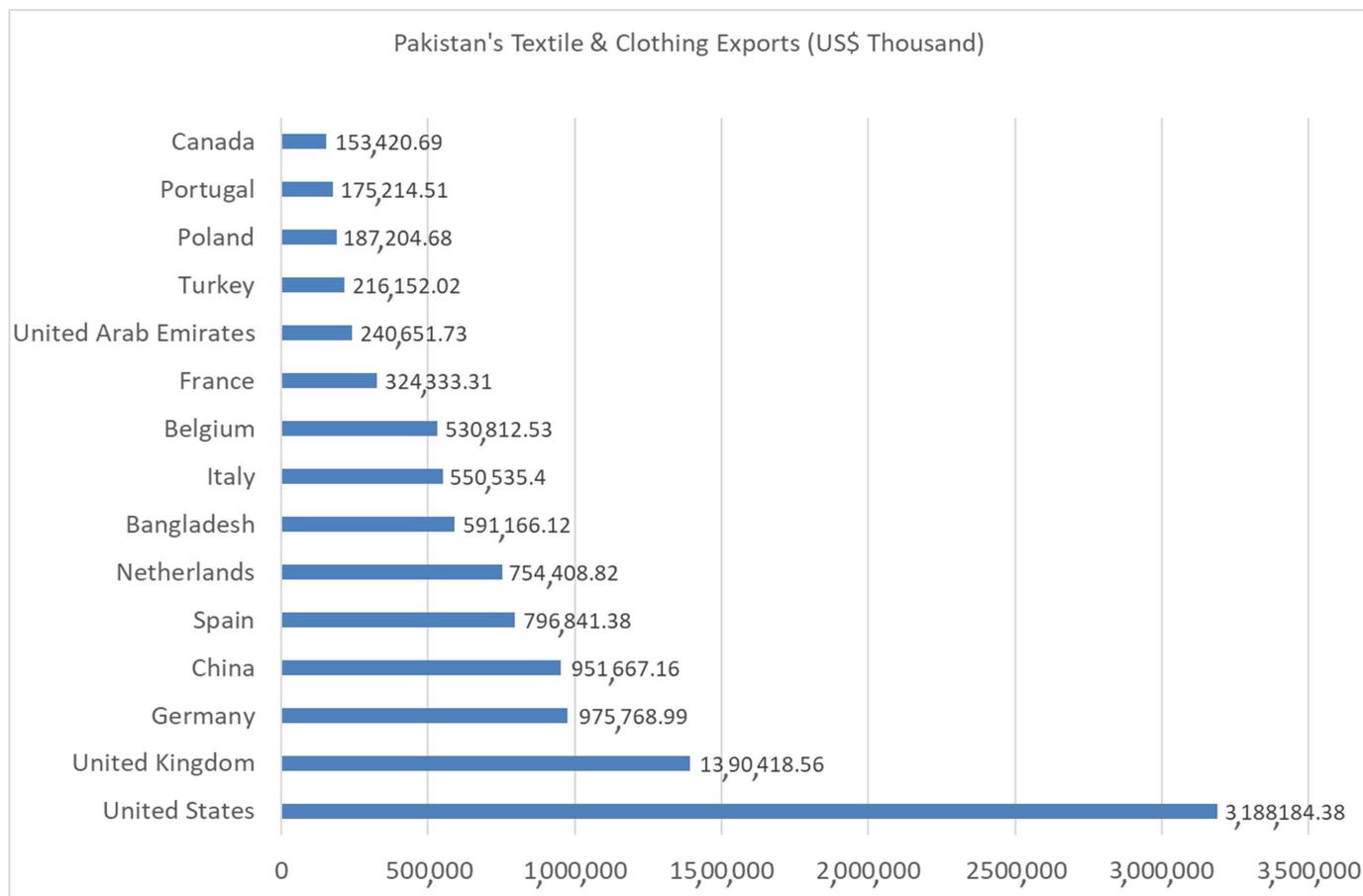
1.2 Status of Pakistan's exports

In 2019, the total exports of Pakistan remained US\$23.81 billion. It can be noted that the top four HS codes (52, 61, 62, 63) group belong to textiles and contribute a major chunk to textile and overall exports. Another HS code (55) group related to the textile of man-made fibres stands at 16th position in Pakistan's exports ⁽¹⁴⁾.

1.2.1 Top textile export destinations

The textile and clothing exports of Pakistan are mainly concentrated to the United States (22 per cent) and European Union (EU) (more than 40 per cent). Details of the top textile and clothing export destination of Pakistan are given in figure 5.

Figure 5. Top textile and clothing export destinations for Pakistan ⁽²⁾



In 2019, the total imports of Pakistan were US\$50.13 billion. Imports decreased by 17 per cent in the year 2018-19 due to recent reforms introduced by the government. It mainly includes petroleum products, machinery and equipment, electronic and electrical equipment, iron and steel, organic chemicals, and plastics.

In textile and clothing, Pakistan imports were about US\$3.8 billion. It included import of cotton products (HS code 52) worth US\$833 million and man-made fibres worth US\$365 million. The other products included natural fibres like jute, flax etc. The main chunk of imports in textile and clothing was from China and United States. Top textile and clothing importers to Pakistan are given in Figure 6.

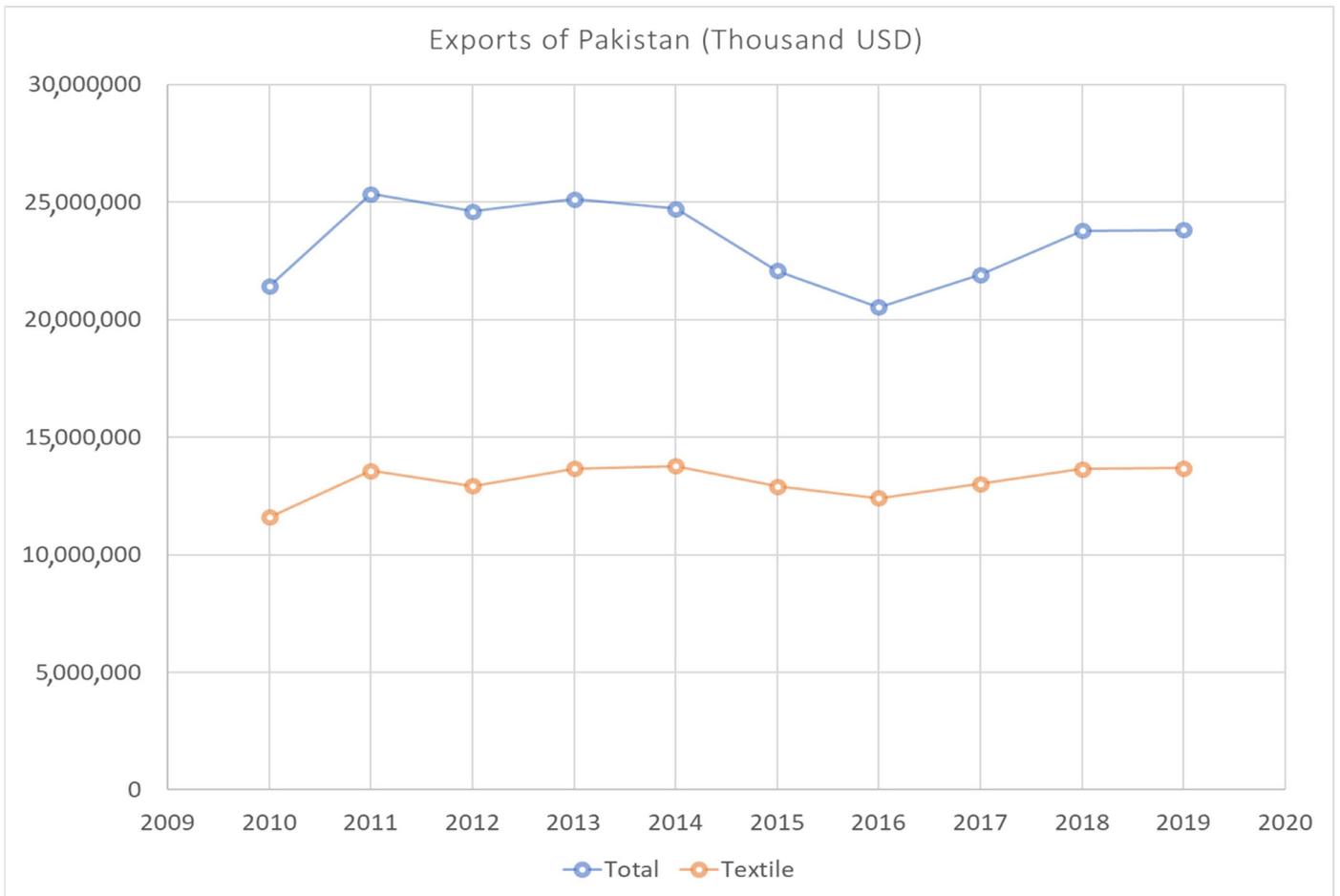
Figure 6. Top textile and clothing importing countries for Pakistan (2018) ⁽²⁾



The textile and clothing exports of Pakistan are mainly concentrated to the United States (22 per cent) and European Union (EU) (more than 40 per cent).

During the last decade (figure 7), the textile and clothing exports of Pakistan remained stagnant. As the total exports are heavily reliant on textiles, overall exports showed a similar trend.

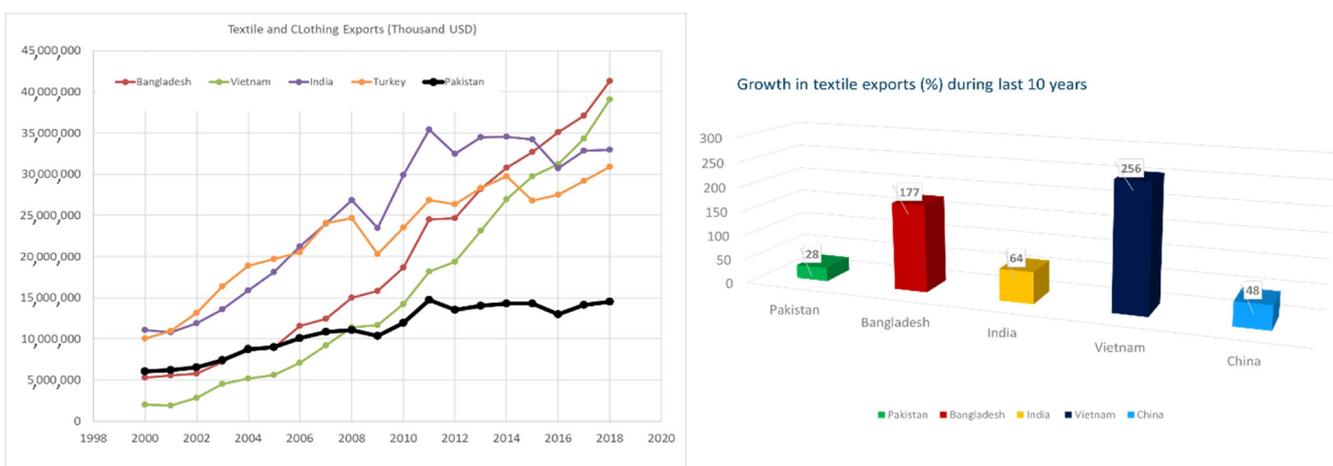
Figure 7. Total and textile exports of Pakistan from 2009-19 (2)



On the other hand, the exports of regional countries like Bangladesh, India, Vietnam and China are increasing at a significant rate (figure 8). During the last decade, textile and clothing exports of China, despite having a big base, increased by 48 per cent, Vietnam increased by 256 per cent, India by 64 per cent and Bangladesh by 177 per cent. The textile exports of Pakistan grew by 28 per cent in the same duration, which is lowest in the region and among all the competitors.

Since Pakistan's exports are heavily dependent on textiles (58 per cent), this slow growth is badly affecting overall exports, the current account deficit and new employment generation.

Figure 8. Comparison in growth of textile exports of Pakistan with regional countries (2)

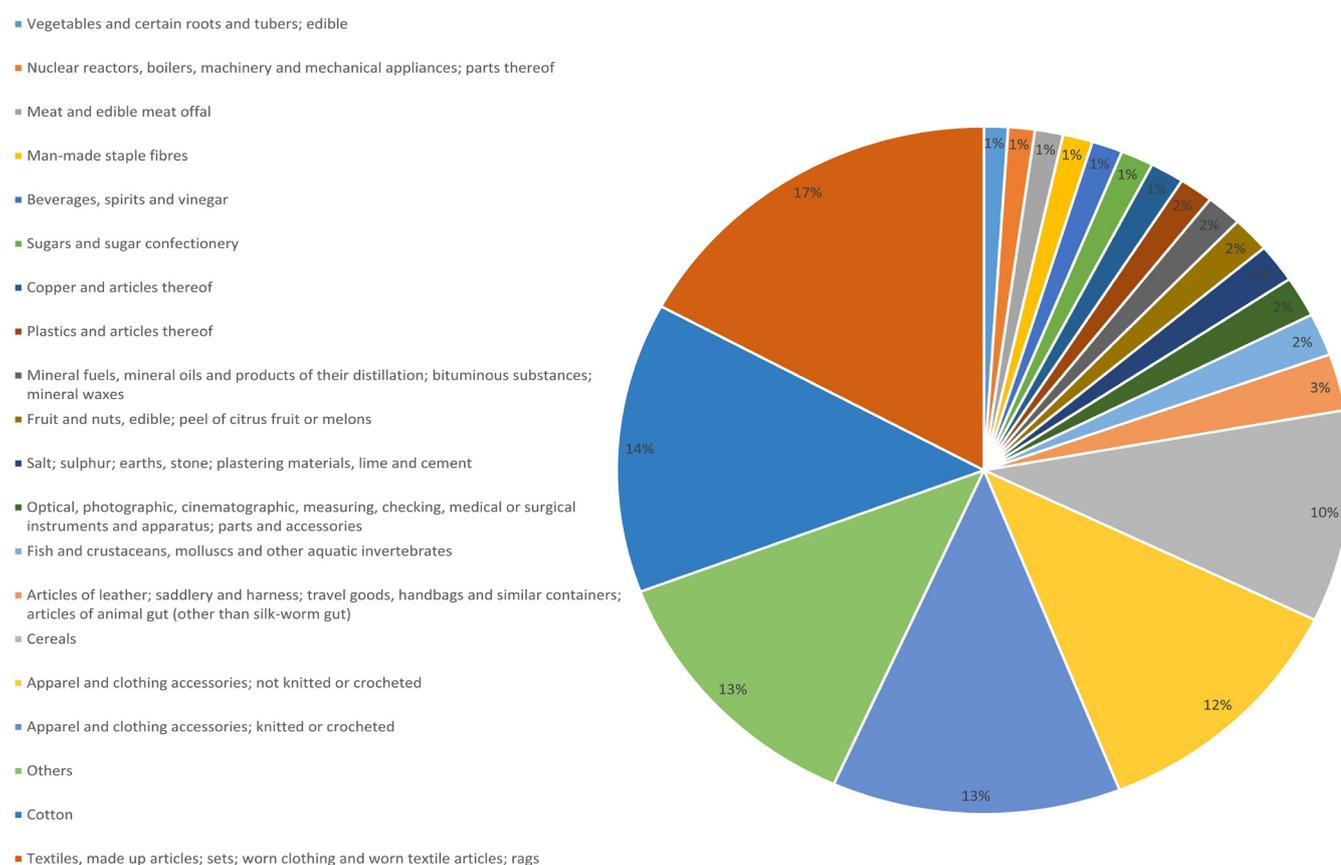


The textile exports of Pakistan grew by 28 per cent in the same duration, which is lowest in the region and among all the competitors.

Breakdown of total exports of Pakistan in 2019 is given in figure 9. Out of the five major export groups (HS codes) contributing 68 per cent of exports, four are related to textile and clothing, whereas the fifth one is cereals.

Figure 9. Breakdown of total exports of Pakistan in 2019 ⁽²⁾

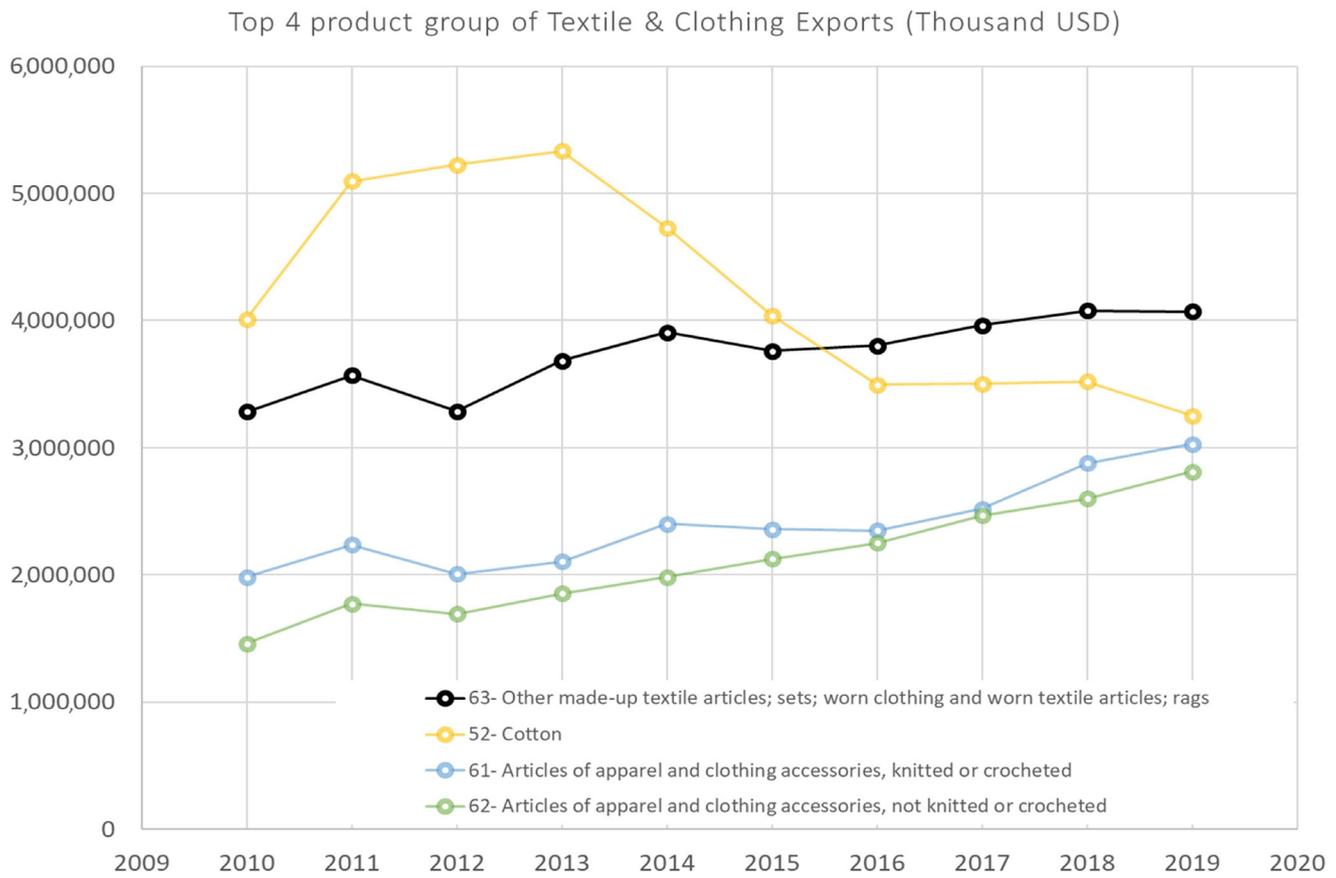
Exports of Pakistan in 2019 (US\$23.81 billion)



As per the breakdown of exports of textiles, the top four product groups/sectors cover 97 per cent of exports. These include HS code group 63 (made up textiles) that contributes 30 per cent to textile and clothing exports, HS code group 52 (articles of cotton) that contributes 24 per cent to textile and clothing exports, HS code group (61) article of apparel and clothing accessories, knitted or crocheted that contributes 22 per cent to textile and clothing exports and HS code group (62) article of apparel and clothing accessories, not knitted or crocheted that contributes 21 per cent to textile and clothing exports.

Trends changed in the textile and clothing exports of Pakistan in four major product groups in the last ten years are given in figure 10. It can be noted that the exports of Pakistan are increasing, though slowly, in made ups and garments groups, whereas exports are decreasing in product group cotton.

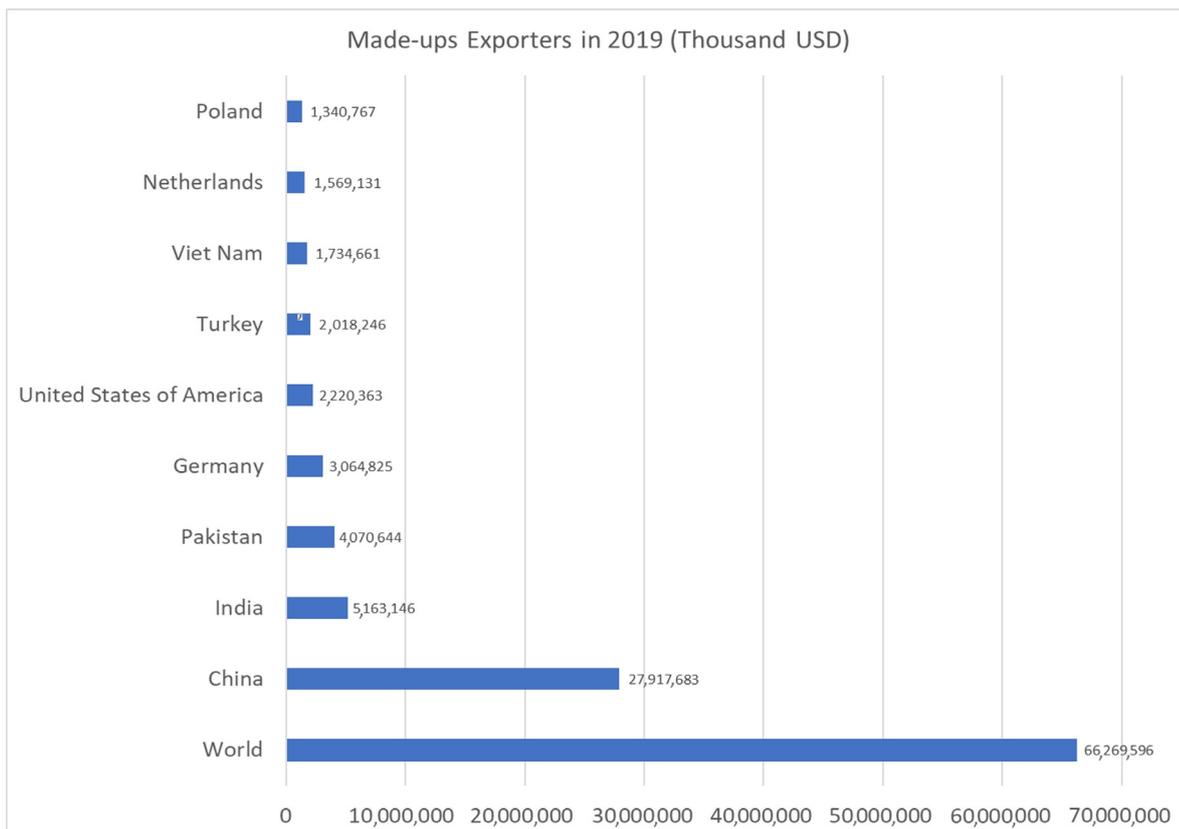
Figure 10. Variation in four top textile exports product groups of Pakistan from 2009-19 ⁽²⁾



1.2.2 Made-ups ⁽⁶³⁾

The total world market of made ups is about US\$66 billion (figure 11). China is the largest exporter in this product group with an accumulative export of US\$28 billion.

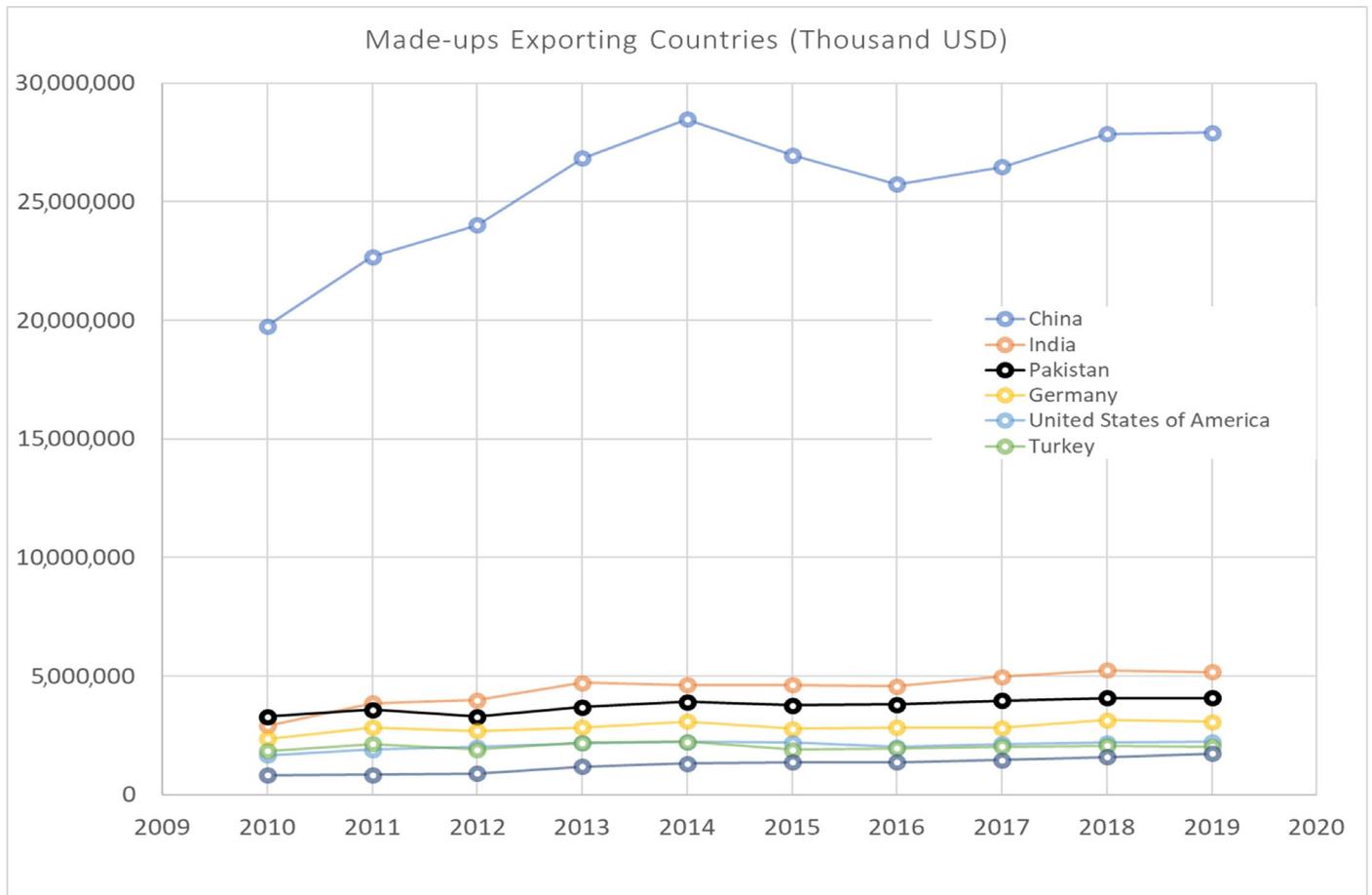
Figure 11. Top exporter countries of made ups (HS code 63) in 2019 ⁽²⁾



In this product group, Pakistan stands at number four in 2019 with an export of worth US\$4.07 billion.

Comparison of growth in the exports of top performing countries in HS code 63 is given in figure 12. There is a growing trend in exports from China and the world. However, exports of other countries including Pakistan remained almost same.

Figure 12. Comparison of made ups (HS code 63) exports from 2009-19 ⁽²⁾



Looking at the additional breakdown (figure 13) of this product group (63) exports by Pakistan, it can be seen that 80 per cent of the total is contributed by bedlinen, table linen, toilet linen etc.



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Figure 13. Breakdown of made ups (HS Code 63) exports of Pakistan in 2019 ⁽²⁾

Export of HS code 63, US\$4.0 billion

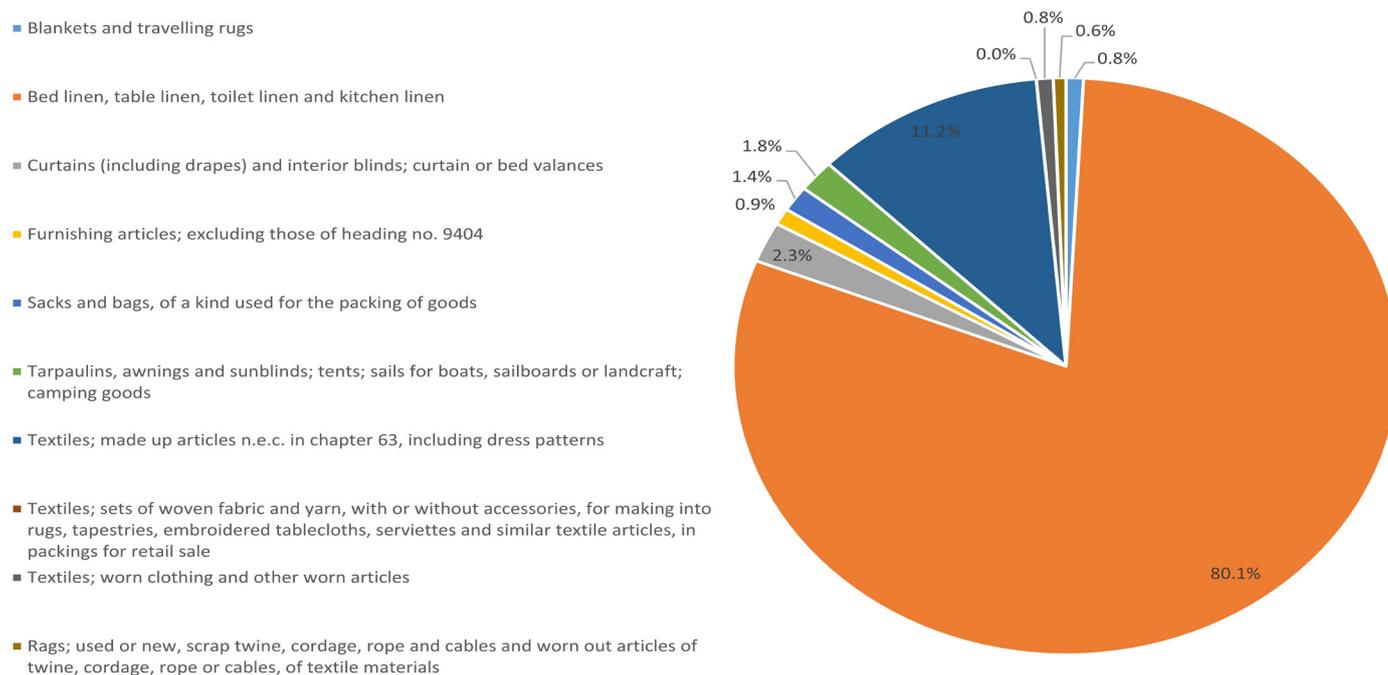


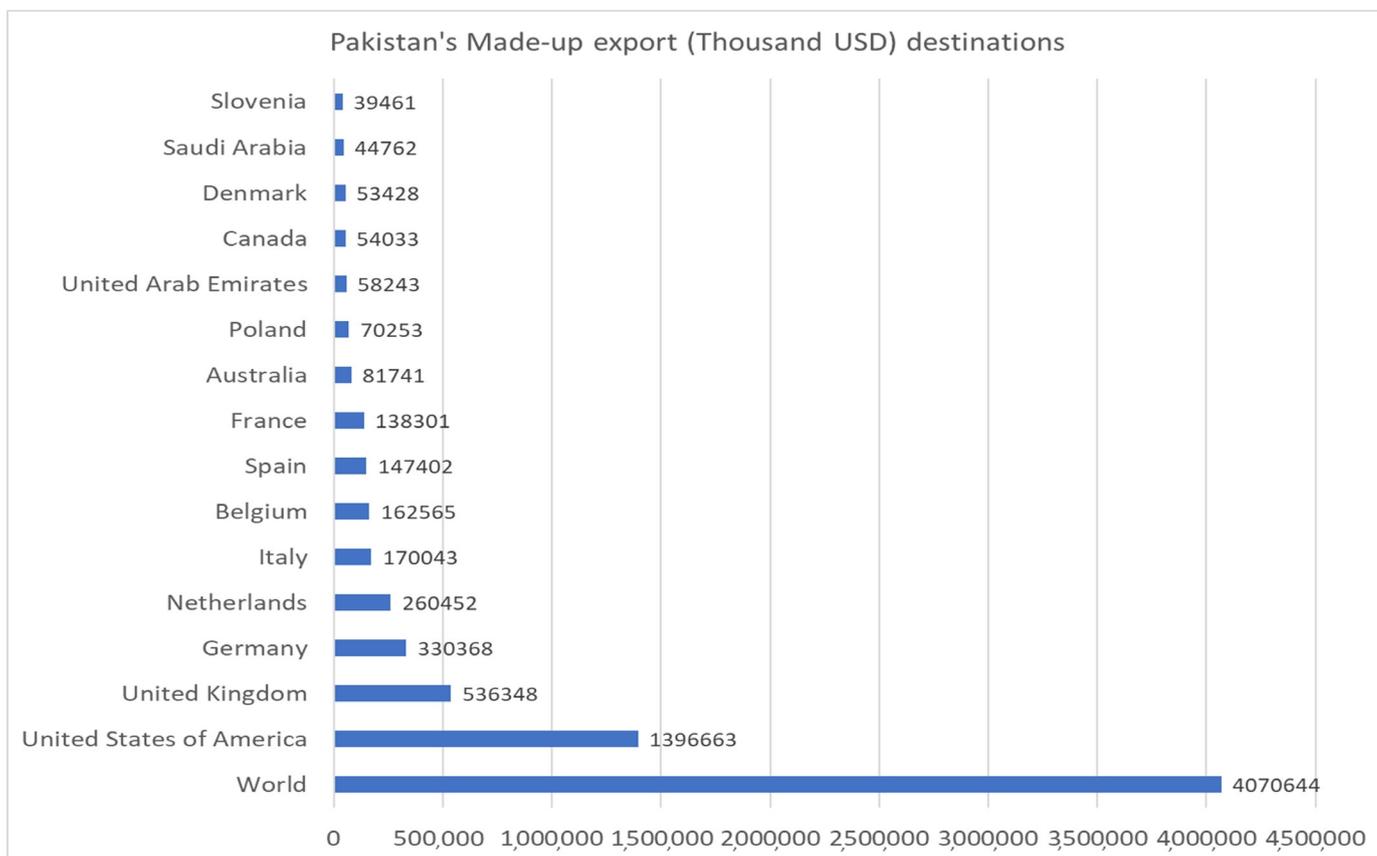
Figure 14. Growth in Pakistan's exports of different articles (HS Code 63) during 2009-19 ⁽²⁾



The growth in exports of different products of HS group 63 during the last 10 years is shown in figure 14. There is a significant growth in the export of bed linen, table linen etc. but as compared to growth of China, this is insignificant. The growth in other categories is almost zero in the last decade.



Figure 15. Made ups (HS Code 63) export destinations of Pakistan in 2019 ⁽²⁾

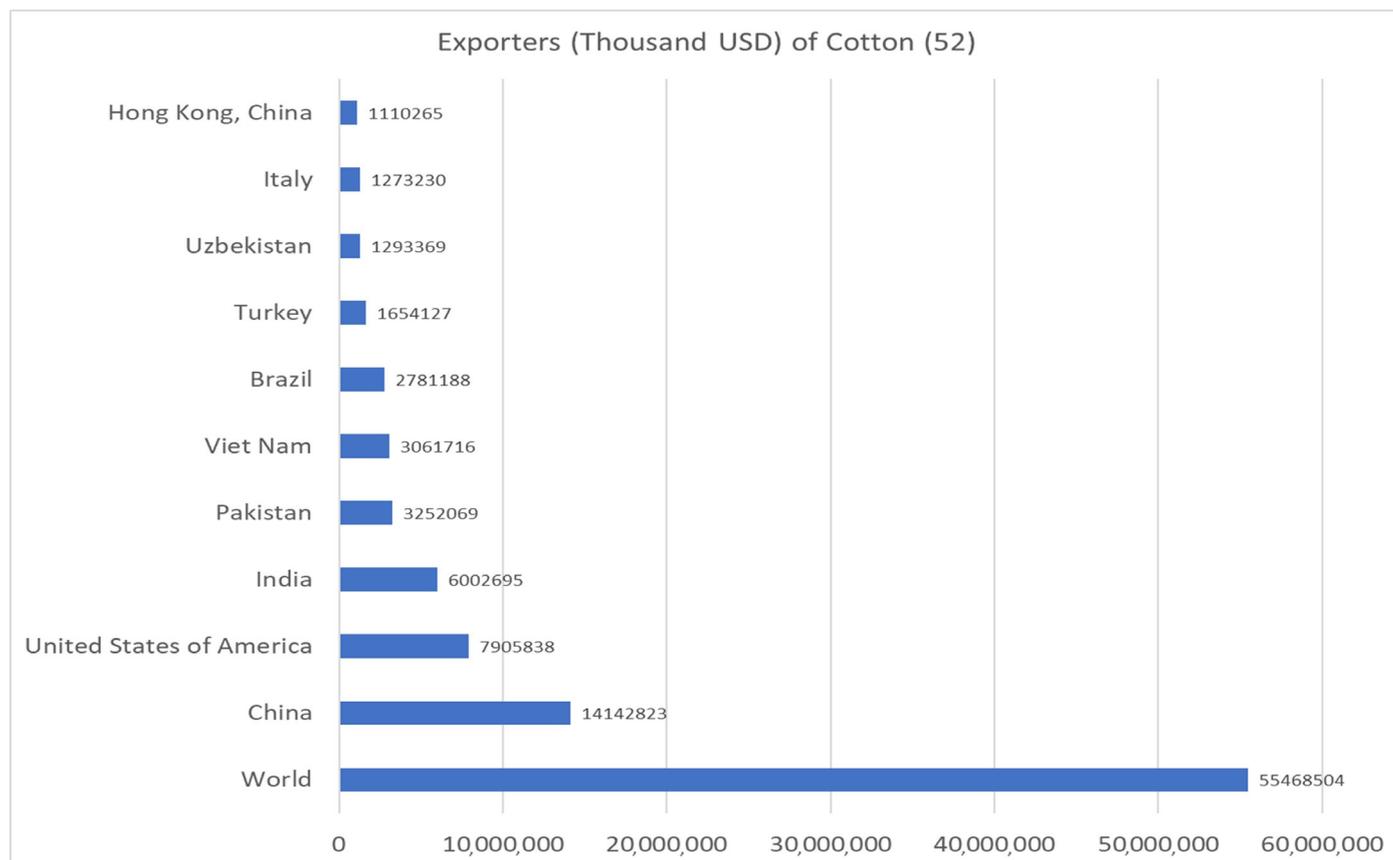


The major destinations for Pakistan’s made ups exports are the United States and European Union (figure 15). This includes United States (US\$1.4 billion), UK (US\$0.5 billion), Germany (US\$0.3 billion) etc.

1.2.3 Cotton ⁽⁵²⁾

The total world market of articles made of cotton (HS code 52) is about US\$55 billion (figure 16). China is the largest exporter in this product group with an accumulative export of US\$14 billion. Pakistan is in fourth position with an export of US\$3.25 billion.

Figure 16. Top exporter countries of cotton products (HS code 52) in 2019 in the world ⁽²⁾



Taking into account the further breakdown (figure 17) of this product group (52) exports by Pakistan, 33 per cent of it is contributed by cotton yarn, 28 per cent by woven fabrics of cotton weighing heavier than 200 g/m² (including denim fabrics/products), 19 per cent by woven fabrics of cotton weighing lighter than 200 g/m² and 9 per cent by woven fabrics of cotton of mixed weight.

Figure 17. Breakdown of cotton (HS code 52) group exports of Pakistan in 2019 ⁽²⁾

Exports of Pakistan in Cotton (52), US\$3.25 billion

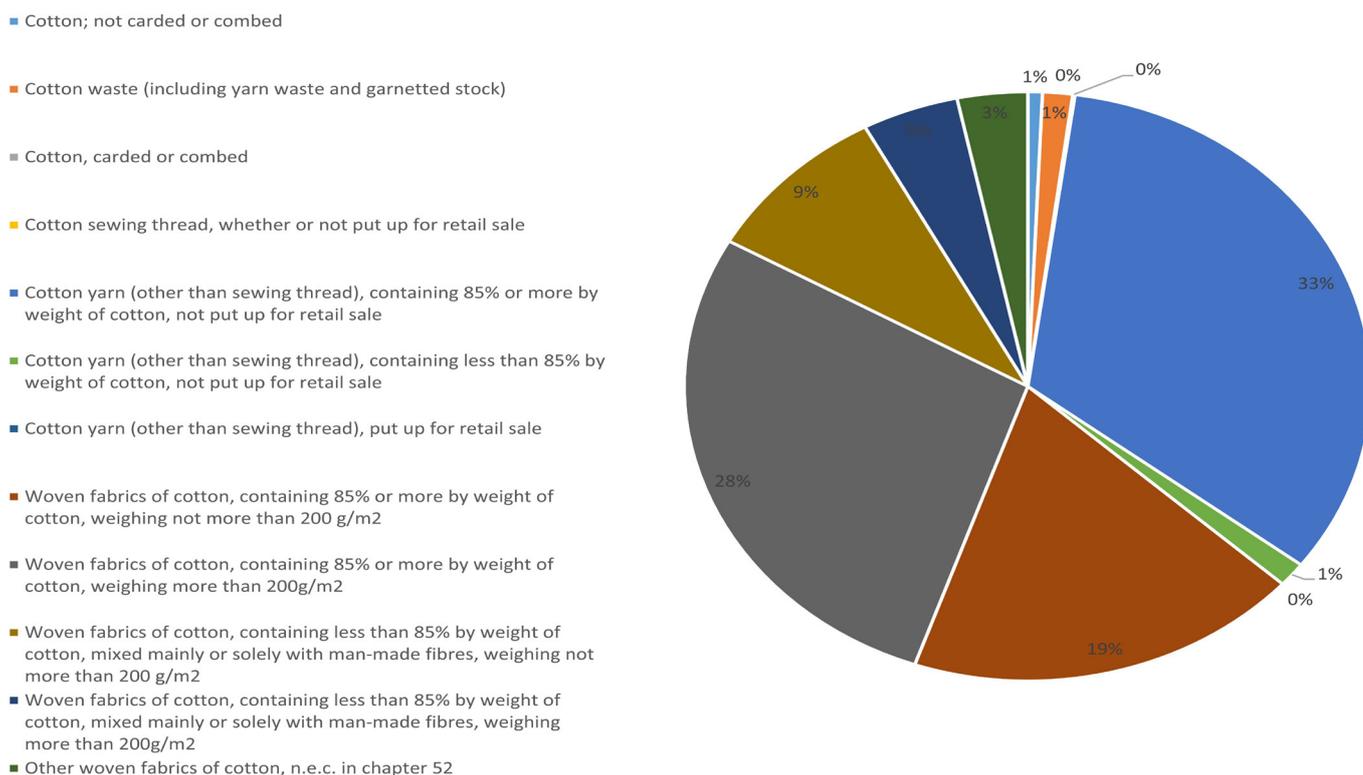
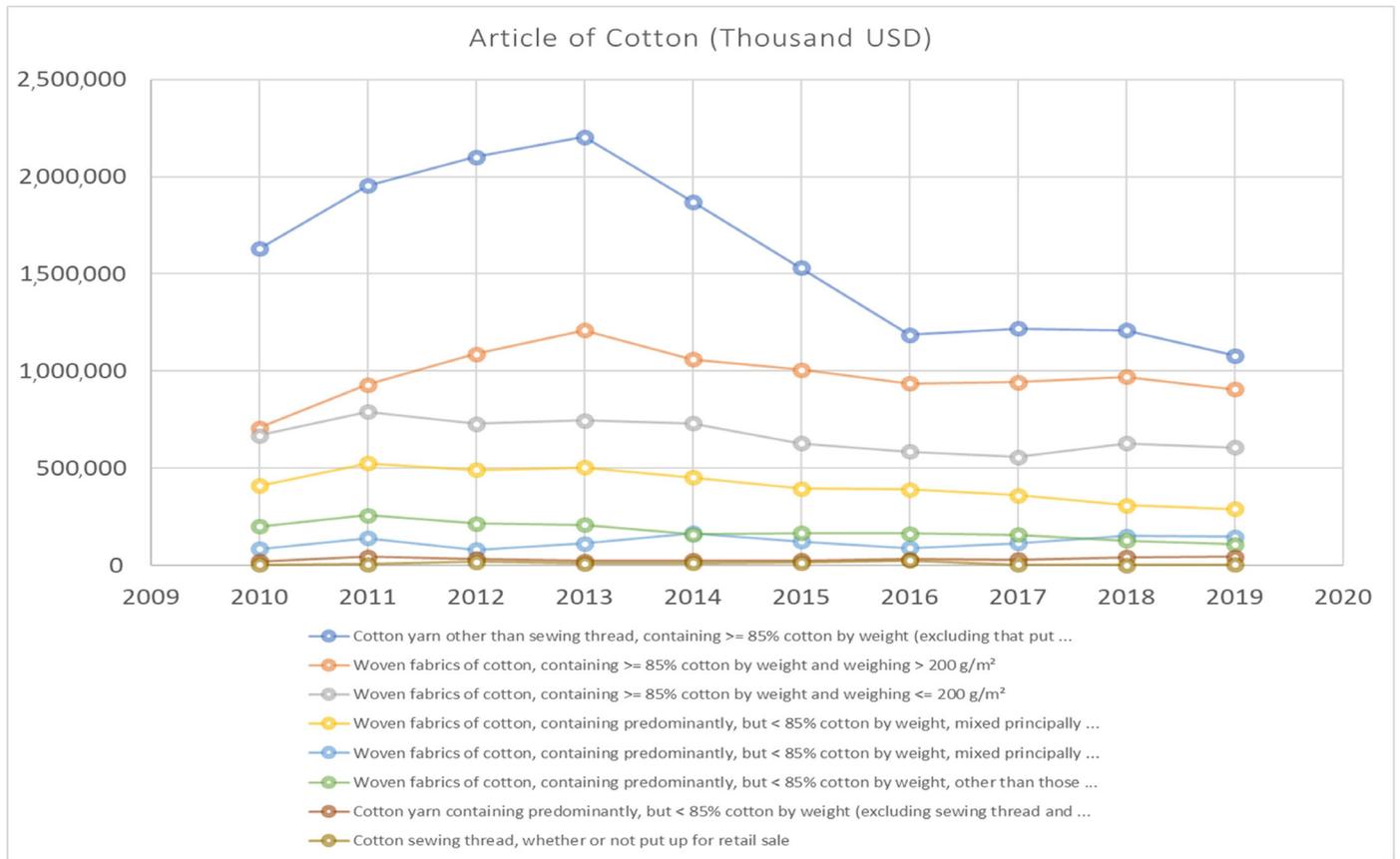
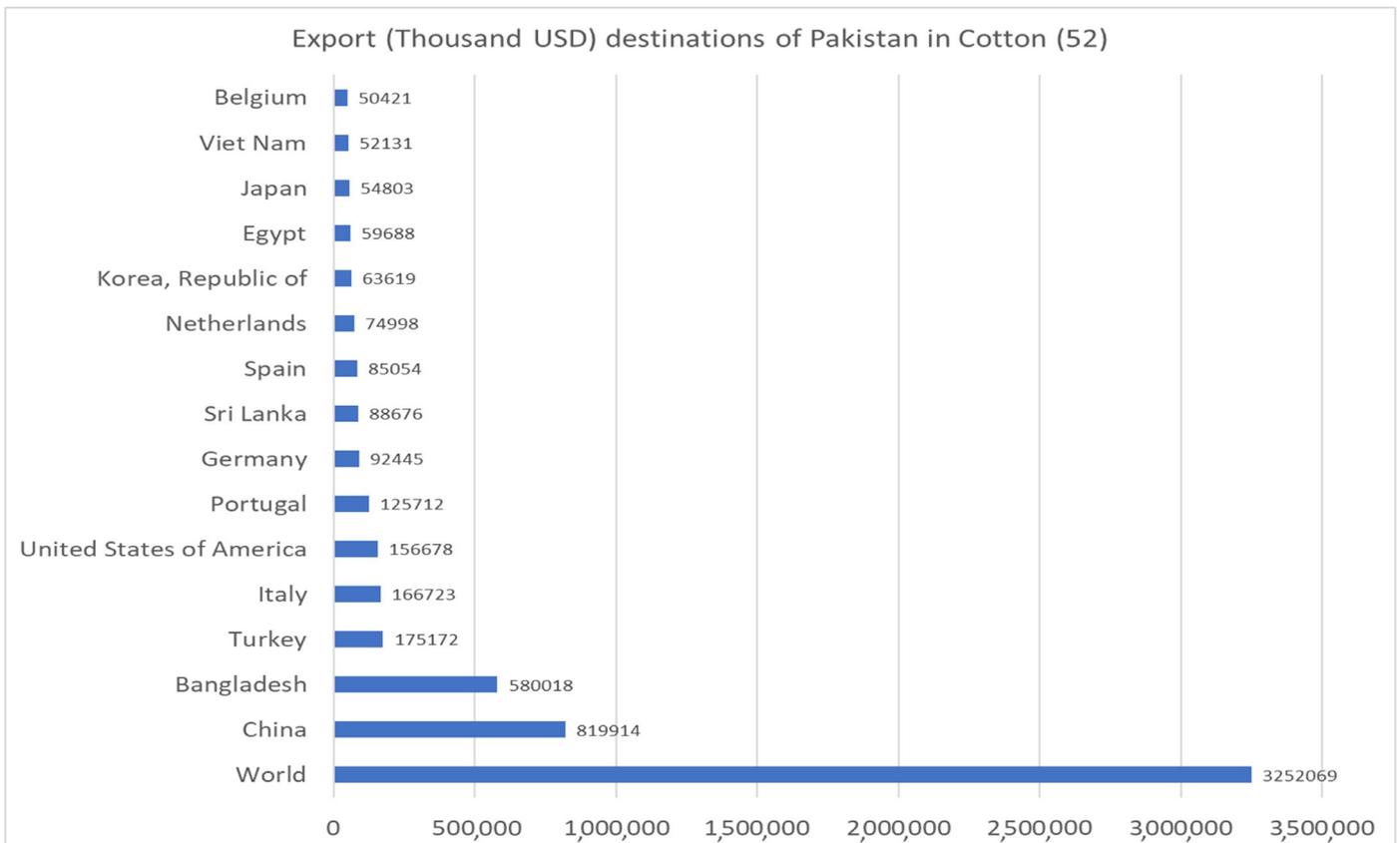


Figure 18. Growth in Pakistan's exports of different articles (HS code 52) during 2009-19⁽²⁾



The growth in exports of different products of HS group 52 during the last 10 years is shown in figure 18. There is a significant loss of exports in the cotton yarn category, however, the growth in other categories is almost zero in the last decade.

Figure 19. Cotton (HS code 52) export destinations of Pakistan in 2019⁽²⁾

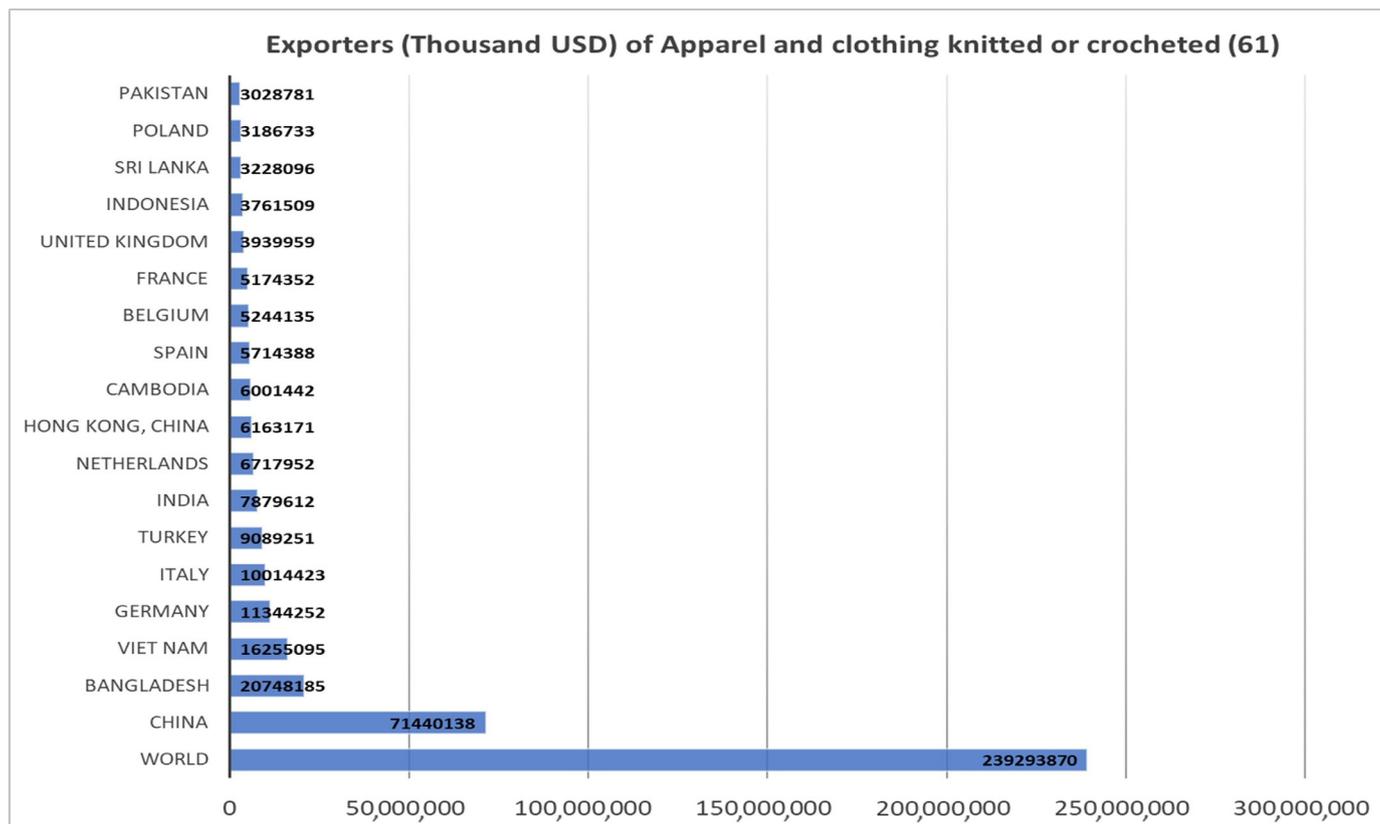


The major destinations for Pakistan’s cotton product exports are China, Bangladesh, Turkey and Italy (figure 19). The first three countries import mainly Pakistani cotton yarns and convert it into finished products.

1.2.4 Articles of apparel and clothing accessories, knitted or crocheted ⁽⁶¹⁾

The total world market of apparel articles and clothing (HS code 61) is about US\$239 billion (figure 20). China is the largest exporter in this product group with an export worth US\$71.4 billion followed by Bangladesh (US\$20.7 billion) and Vietnam (US\$16.25 billion). Pakistan is at 18th position with an export of US\$3.02 billion.

Figure 20. Top exporter countries of apparels and clothing knitted or crocheted (HS code 61) in 2019 in the world ⁽²⁾



As evident from figure 21, China remained the leading exporter in HS code 61 group during 2010-19, however, its exports trend has decreased since 2013 despite an increasing trend in the world exports. In this same duration, Bangladesh gained a significant share in this group.

Figure 21. Country wise export trend of apparel and clothing knitted or crocheted (HS code 61) in 2010-19 in the world ⁽²⁾

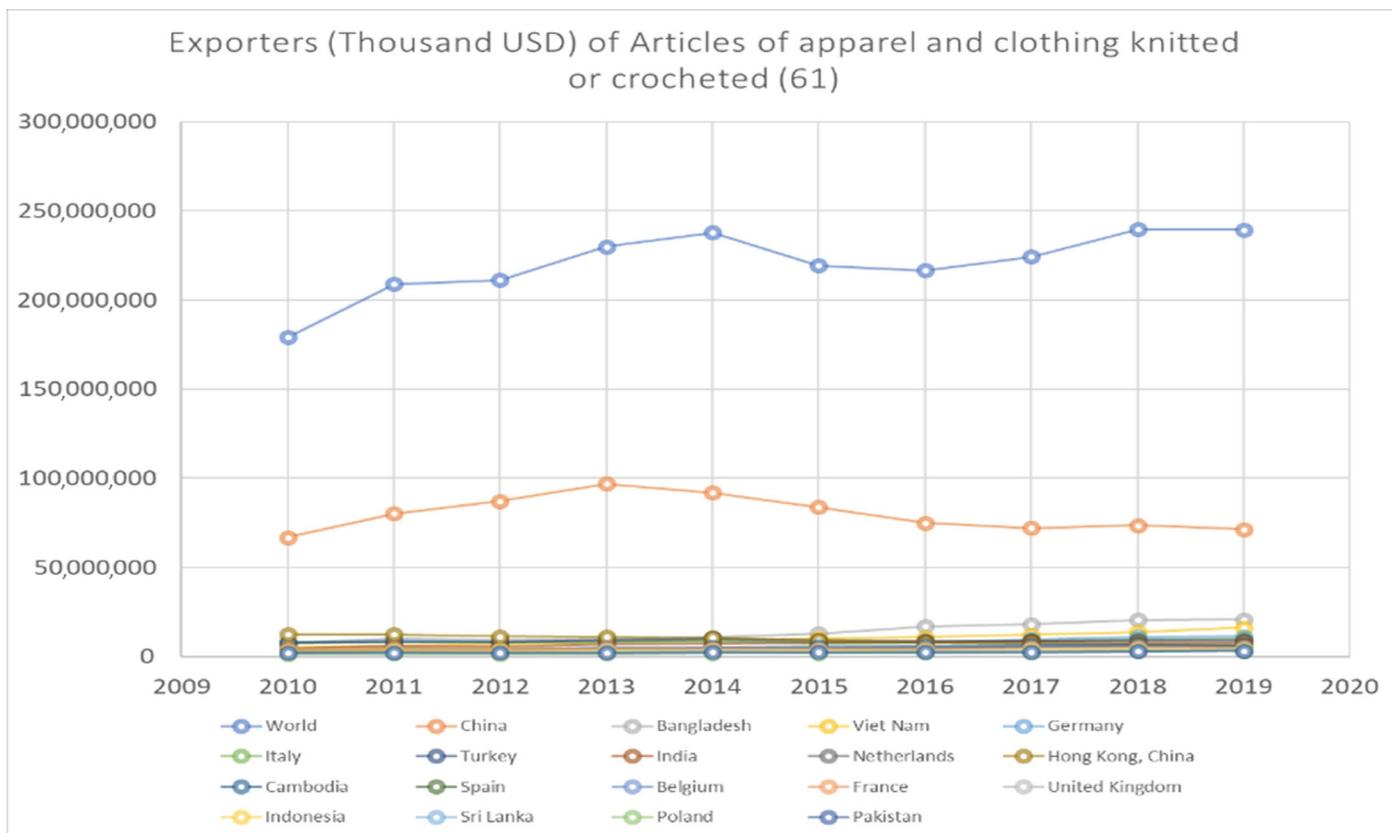
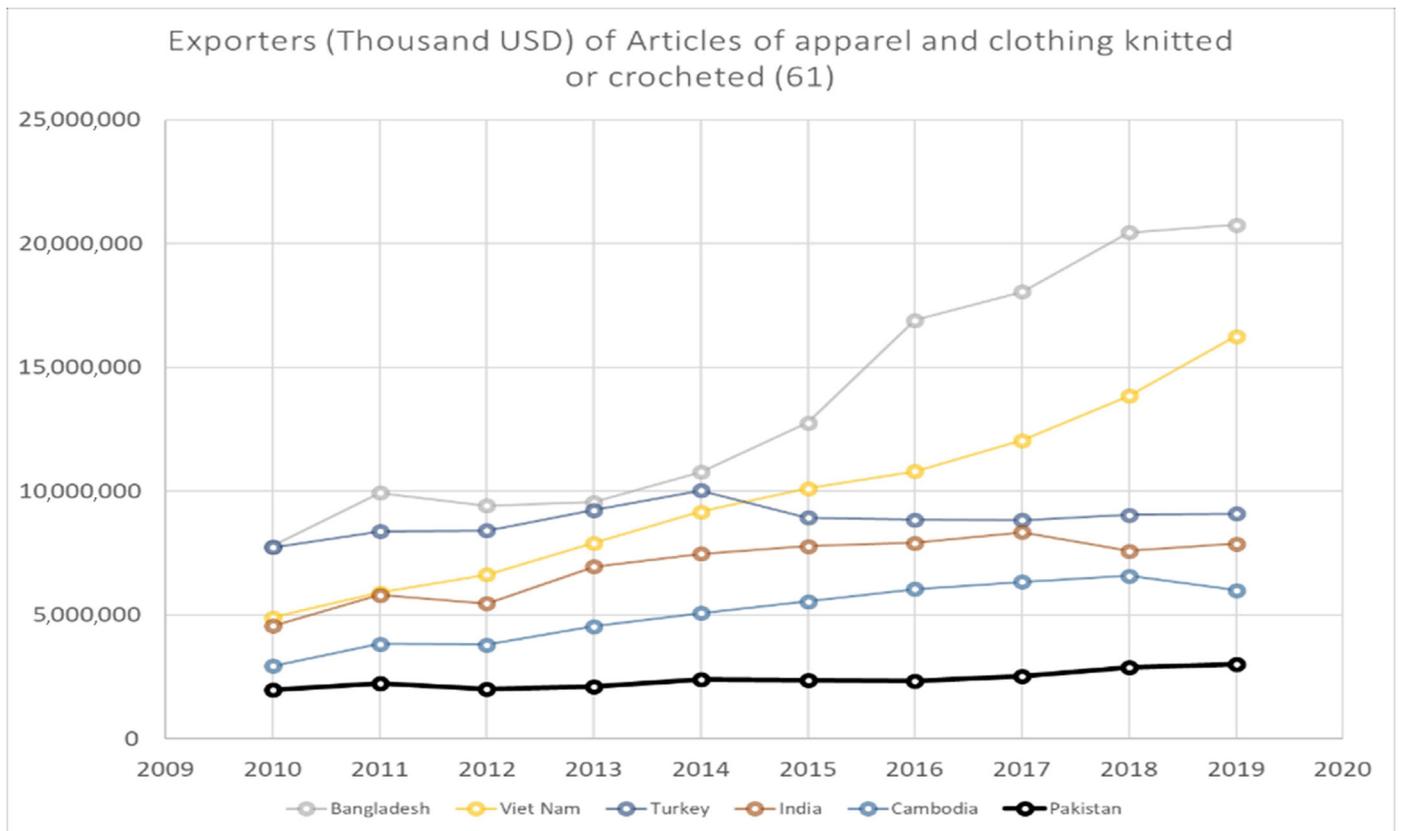


Figure 22 shows growth in exports of Bangladesh, Vietnam, Turkey, India, Cambodia and Pakistan during 2010-19. In this duration, an exponential growth in Bangladesh and Vietnam exports can be seen whereas, in comparison to these countries, growth in Pakistan's exports is nominal.

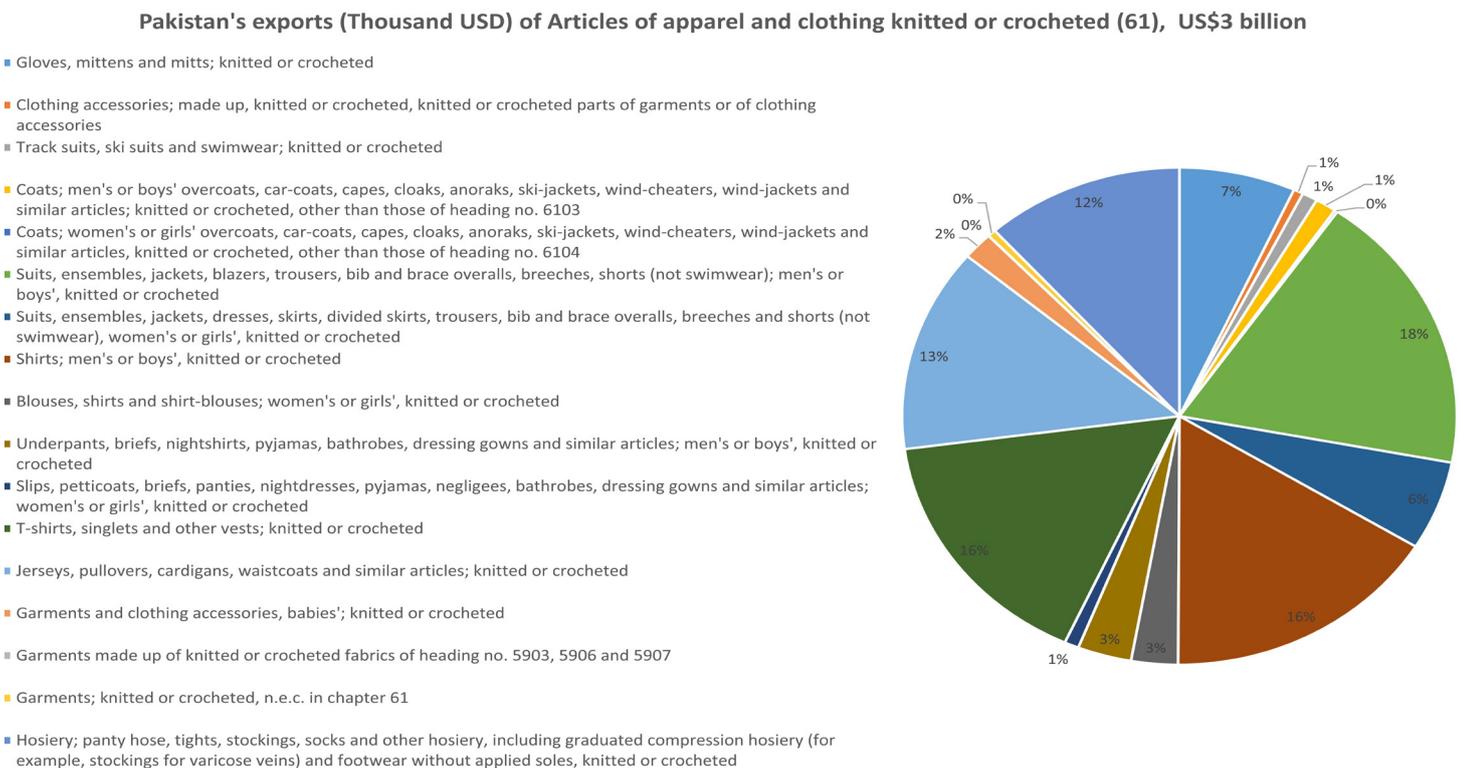
China remained the leading exporter in HS code 61 group during 2010-19, however, its exports trend has decreased since 2013

Figure 22. Country wise export trend of apparel and clothing knitted or crocheted (HS code 61) in 2010-19 in the world (2)



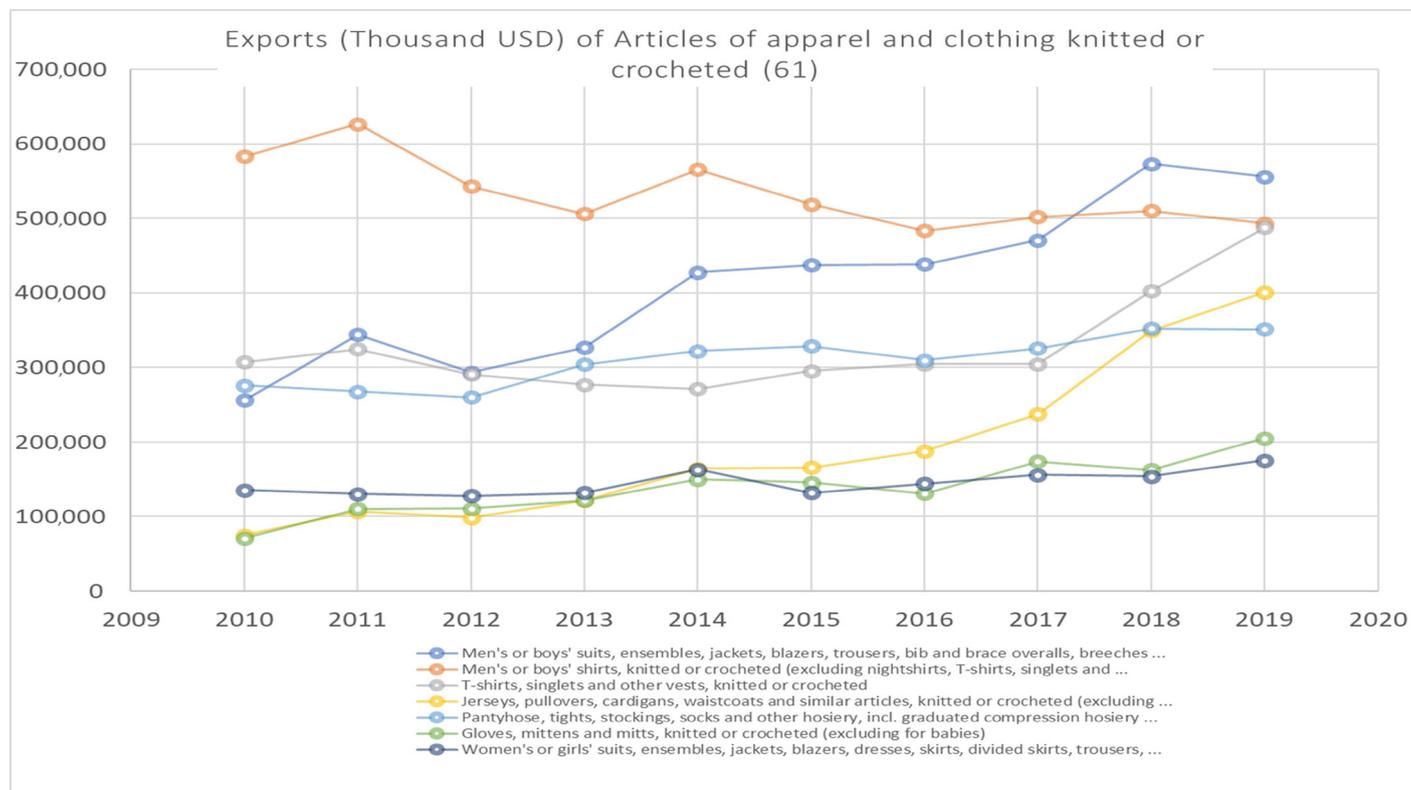
If we look at the further breakdown (figure 23) of this product group (61) exports by Pakistan, 18 per cent of it is contributed by men/boys’ knitted suits, 16 per cent by men’s shirts, 16 per cent by T-shirts, 13 per cent by jerseys/pullovers and 12 per cent by pantyhose/tights etc.

Figure 23. Breakdown of made ups (HS Code 63) exports of Pakistan in 2019 (2)



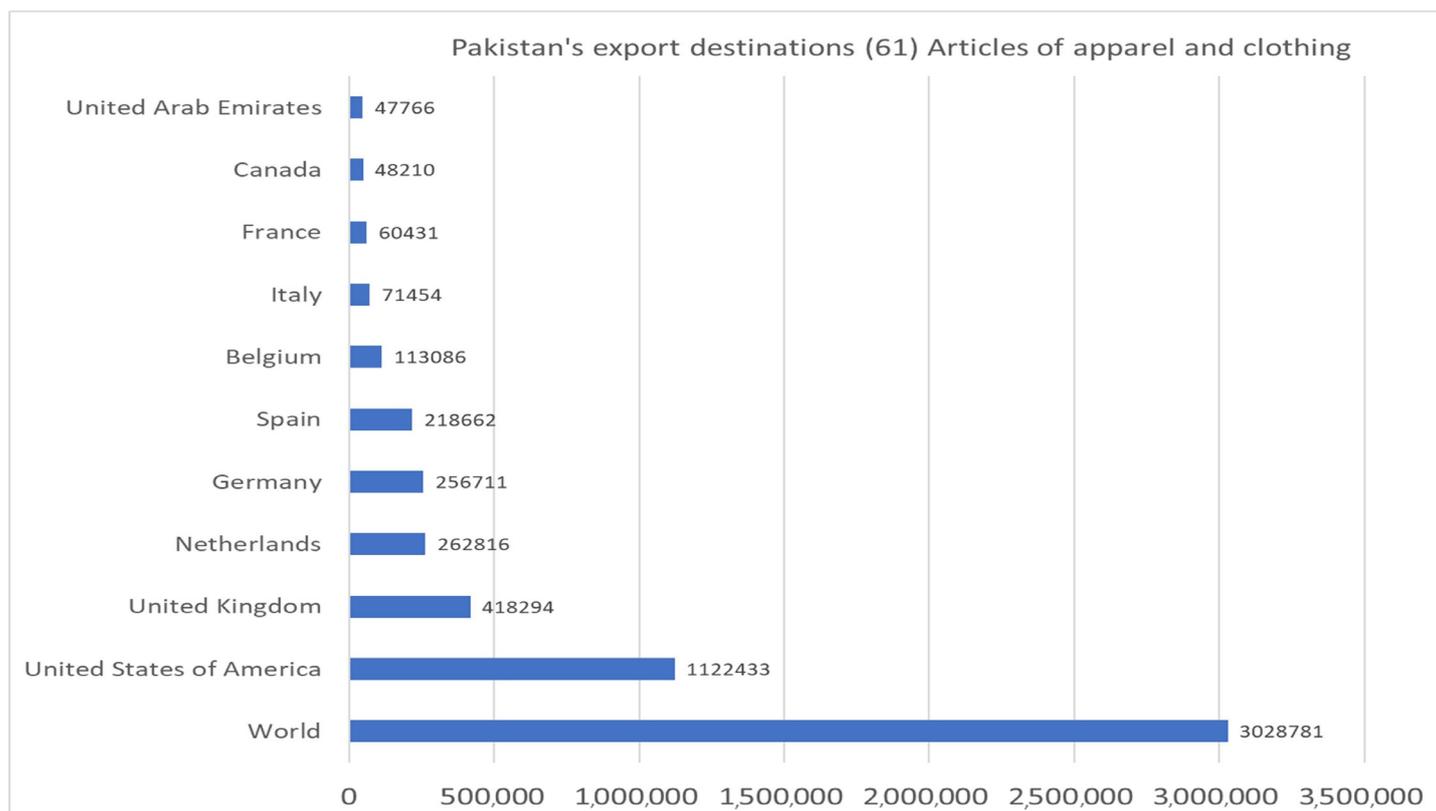
The growth in exports by Pakistan in major articles of this product group (61) is shown in figure 24. There is a significant growth in men/boys' knitted suits, jerseys/pullovers and T-shirts during the last 10 years. The exports of pantyhose/tights remained almost the same whereas negative growth was recorded in articles like men's shirts.

Figure 24. Growth in Pakistan's exports of different articles (HS Code 61) during 2009-19⁽²⁾



The top destination in this group remained United States (US\$1.12 billion) and European Union (EU) with about 80 per cent of the share as shown in figure 25.

Figure 25. Articles of knitted apparel and clothing (HS Code 61) export destinations of Pakistan in 2019⁽²⁾



1.2.5 Articles of apparel and clothing accessories, not knitted or crocheted ⁽⁶²⁾

The total world market of apparel articles and clothing not knitted or crocheted (HS code 62) is about US\$236 billion (figure 26). China is the largest exporter in this product group with an export worth US\$67 billion followed by Bangladesh (US\$19.6 billion) and Vietnam (US\$17.0 billion). Pakistan is at 17th position with an export of US\$2.81 billion.



Figure 26. Top exporter countries of apparel and clothing, not knitted or crocheted (HS code 62) in 2019 in the world ⁽²⁾

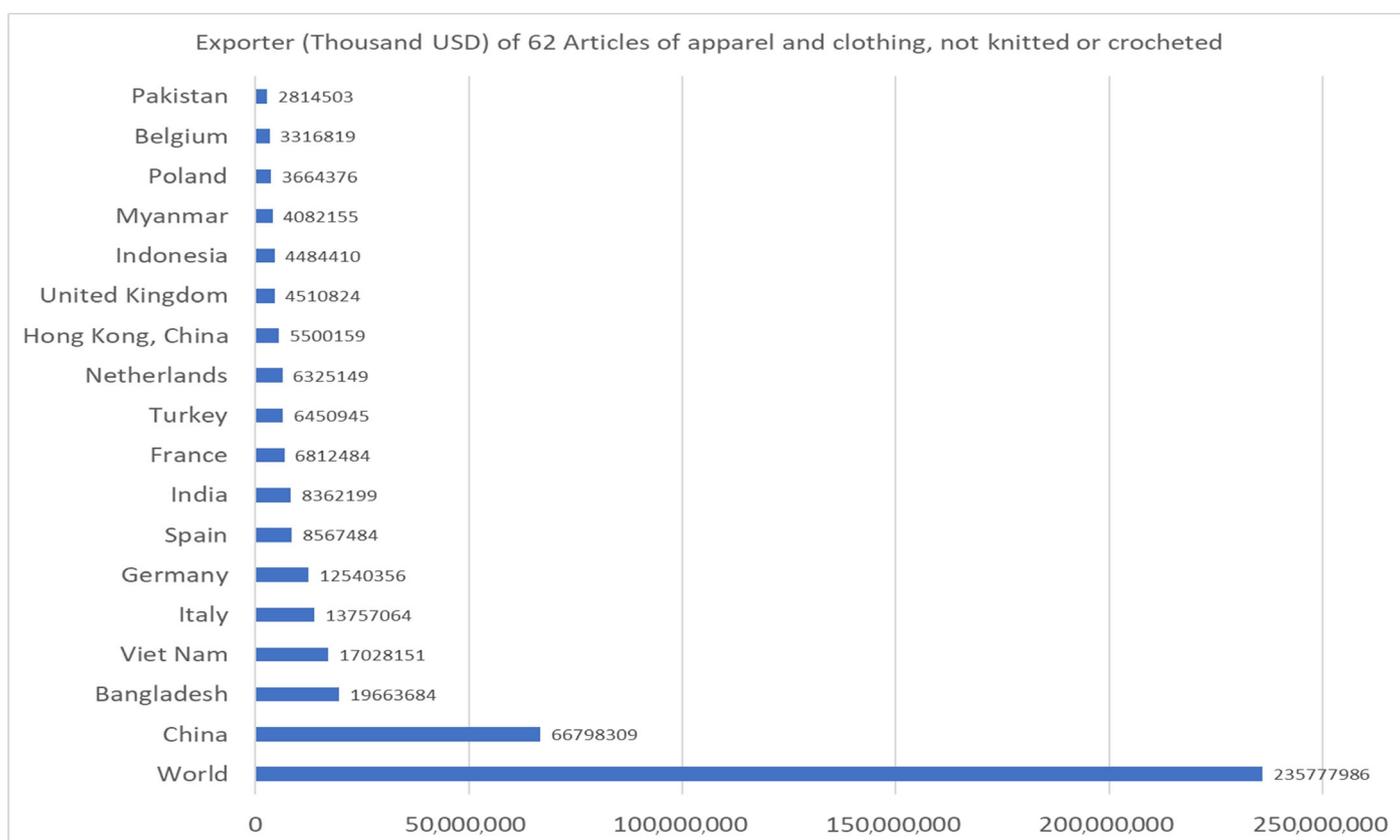
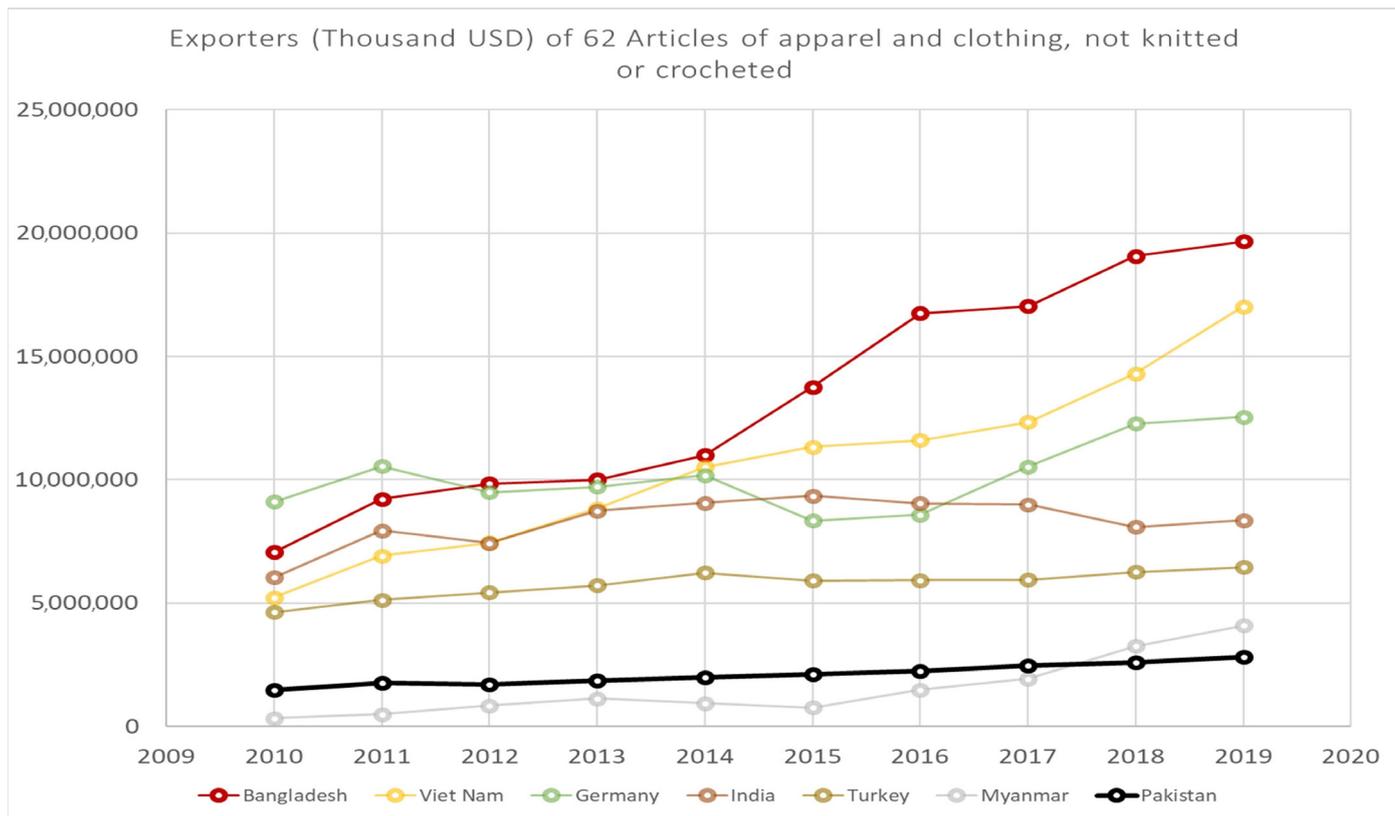


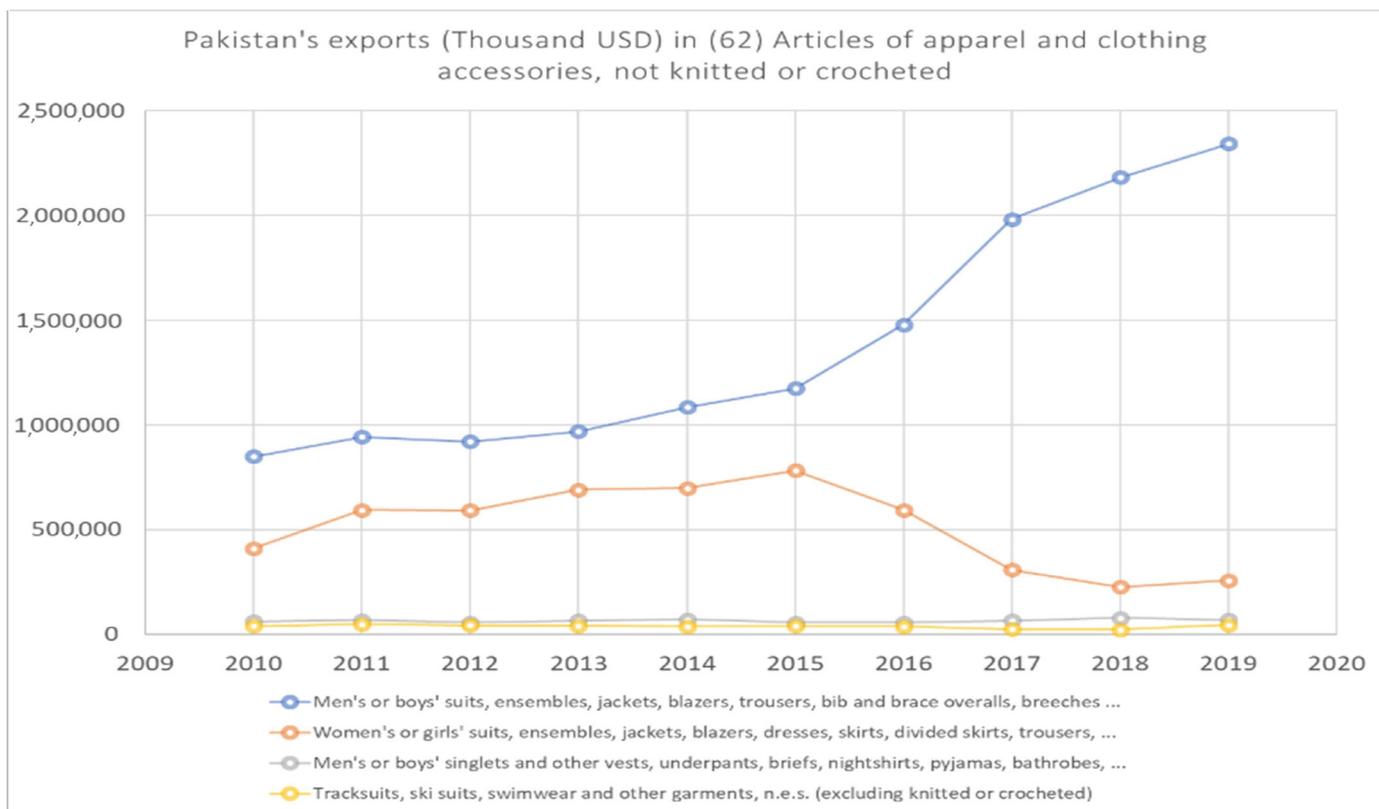
Figure 27. Country wise export trend of apparel and clothing not knitted or crocheted (HS code 62) in 2010-19 in the world⁽²⁾



In this duration, an exponential growth in the exports of Bangladesh and Vietnam can be seen whereas, in comparison to these countries, growth in Pakistan’s exports is nominal. Myanmar appeared as a new player in this segment crossing Pakistan in exports in 2018. The increasing trend in exports of Germany is mainly due to its production of technical textiles.

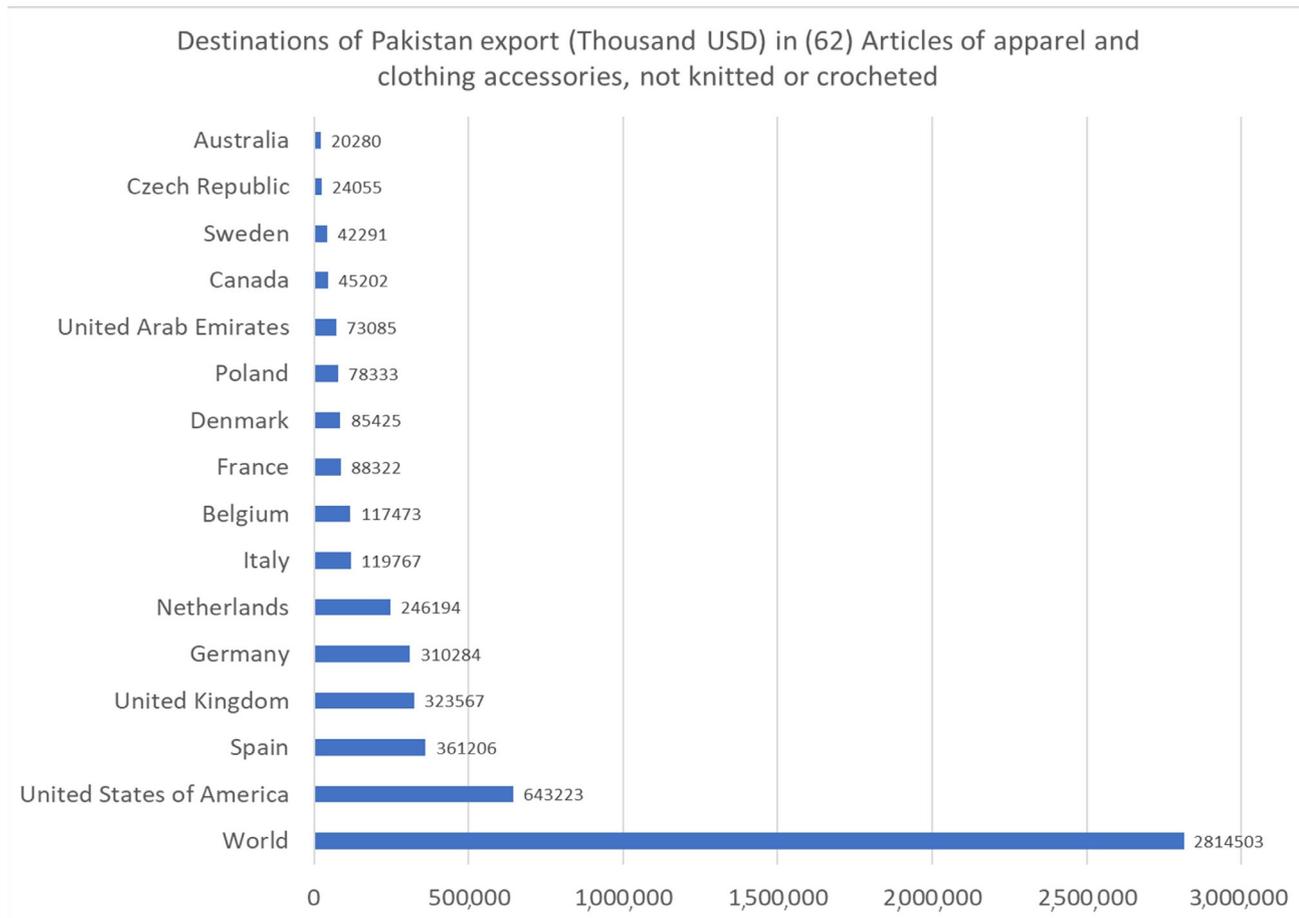
Taking into account the further breakdown of exports of Pakistan in this segment, the major contributor (83 per cent) is men’s suits etc. followed by women’s suits etc. (9 per cent).

Figure 28. Growth in Pakistan’s exports of different articles (HS code 62) during 2009-19⁽²⁾



The growth of Pakistan's exports in this segment during the last 10 years is given in figure 28. The growth in the articles of men's suits etc. is exponential whereas a significant drop in exports is recorded in women's suits etc. Other categories remained almost the same.

Figure 29. Article of apparel and clothing, not knitted or crocheted, (HS code 62) export destinations of Pakistan in 2019 ⁽²⁾



The list of top export destinations of Pakistan in the category of non-knitted apparel and clothing is given in figure 29. The export of Pakistan in this category is mainly to the United States and European Union that covers about 85 per cent of exports.



1.3 Summary of Pakistan's exports and findings

In table 5, the summary of main contributing HS code groups and article groups of textile and clothing is presented. It can be noted that four HS code groups (52,61, 62 and 63) cover 97 per cent of textile exports.

Table 5. Summary of Pakistan's textile exports (top HS codes) ⁽²⁾

HS Code	Product Group	Global Market (Billion USD)	Pakistan's Export Value (Billion USD)	Share in world's Exports in this category (%)	Global Position of Pakistan as exporter	Share in Pakistan's Textile Exports (%)	Product	Value (thousand USD)	Share in Product Group (%)	Share in Textile Exports (%)
63	Made Up	66	4.0	6.1	4	30	Bedlinen etc	3,261,276	80	24.0
							Madeup article	455,961	11	3.3
52	Cotton	55	3.3	5.9	6	24	Cotton yarn other than sewing thread, containing >= 85% cotton by weight (excluding that put ...	1,078,479	33	7.9
							Woven fabrics of cotton, containing >= 85% cotton by weight and weighing > 200 g/m ²	906,473	28	6.7
							Woven fabrics of cotton, containing >= 85% cotton by weight and weighing <= 200 g/m ²	605,975	19	4.6
							Woven fabrics of cotton, containing predominantly, but < 85% cotton by weight, mixed principally ...	290,399	9	2.2
							Woven fabrics of cotton, containing predominantly, but < 85% cotton by weight, mixed principally ...	147,983	5	1.2
61	Articles of apparel and clothing knitted or crocheted	239	3.0	1.3	18	22	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches ...	556,158	18	4.0
							Men's or boys' shirts, knitted or crocheted (excluding nightshirts, T-shirts, singlets and ...	493,419	16	3.5
							T-shirts, singlets and other vests, knitted or crocheted	487,532	16	3.5
							Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted (excluding ...	401,355	13	2.9
							Pantyhose, tights, stockings, socks and other hosiery, incl. graduated compression hosiery ...	351,324	12	2.6
							Gloves, mittens and mitts, knitted or crocheted (excluding for babies)	205,150	7	1.5
							Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, ...	175,357	6	1.3
62	Articles of apparel and clothing, not knitted or crocheted	235	2.4	1.0	17	21	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches ...	2,343,760	83	17.4
							Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, ...	257,910	9	1.9
							Men's or boys' singlets and other vests, underpants, briefs, nightshirts, pyjamas, bathrobes, ...	69,430	3	0.6
							Tracksuits, ski suits, swimwear and other garments, n.e.s. (excluding knitted or crocheted)	44,865	2	0.4

The summary of products with a share in Pakistan's textile and clothing exports is given in table 6. It can be noted that the top three products contribute 50 per cent to textile of Pakistan. Whereas the top eleven products contribute 80 per cent to textile and clothing exports of Pakistan

Table 6. Summary of Pakistan's textile exports (top products) ⁽²⁾

HS Code (Group)	Product Group	Share of Product Group in Pakistan's Textile Exports (%)	Product	Value (thousand USD)	Share in Product Group (%)	Share in Textile Exports (%)	Commulative share in exports
63	Made Up	30	Bedlinen etc	3,261,276.00	80	24.0	These three products contribute 49.4 percent to textile exports
62	Articles of apparel and clothing, not knitted or crocheted	21	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches ...	2,343,760.00	83	17.4	
52	Cotton	24	Cotton yarn other than sewing thread, containing >= 85% cotton by weight (excluding that put ...	1,078,479.00	33	7.9	
52	Cotton	24	Woven fabrics of cotton, containing >= 85% cotton by weight and weighing > 200 g/m ²	906,473.00	28	6.7	
52	Cotton	24	Woven fabrics of cotton, containing >= 85% cotton by weight and weighing <= 200 g/m ²	605,975.00	19	4.6	
61	Articles of apparel and clothing knitted or crocheted	22	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches ...	556,158.00	18	4.0	
61	Articles of apparel and clothing knitted or crocheted	22	Men's or boys' shirts, knitted or crocheted (excluding nightshirts, T-shirts, singlets and ...	493,419.00	16	3.5	
61	Articles of apparel and clothing knitted or crocheted	22	T-shirts, singlets and other vests, knitted or crocheted	487,532.00	16	3.5	
63	Made Up	30	Madeup article	455,961.00	11	3.3	
61	Articles of apparel and clothing knitted or crocheted	22	Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted (excluding ...	401,355.00	13	2.9	
61	Articles of apparel and clothing knitted or crocheted	22	Pantyhose, tights, stockings, socks and other hosiery, incl. graduated compression hosiery ...	351,324.00	12	2.6	

These eleven product groups contribute 80.4 percent to textile exports

1. Pakistan's textile and clothing export product range is very narrow i.e. 97 per cent of the textile exports are in four product groups (HS code 52,61,62 & 63). Out of these segments, only four products contribute 50 per cent and 11 products contribute 80 per cent to the textile exports.

2. There is an increasing trend in exports of apparel and clothing segment (HS code 61 and 62), but Pakistan's overall textile and clothing exports remained stagnant during the last 10 years due to a decrease in exports of cotton yarn (HS code 52).

3. In the biggest export categories (HS code 61 and 62 worth US\$474 billion), Pakistan's position is 18 and 17 (with a share of US\$5.4 billion) respectively as an exporter.

4. Despite being an agricultural and cotton rich country, there are imports of cotton fibre and its products of worth US\$833 million, jute and flax fibres worth US\$25 million and wool fibres worth US\$10 million.

5. Pakistan's exports are mainly concentrated in the United States (22 per cent) and the European Union (>40 per cent). Pakistan is not tapping markets like Japan, Russia, Korea, Mexico, Switzerland etc. which are importing more than US\$100 billion of textiles and clothing.



6. Pakistan's fibre mix is roughly 30:70 (cotton: man-made) whereas in the world market it is the opposite (70:30).

7. Technical textiles constitute of fibres and fabrics developed specifically for their performance. It is an emerging market of US\$200 billion. The share of technical textiles in Pakistan's export is negligible.

**\$200 BILLION
EMERGING MARKET**

As per the ITC's export potential map ⁽¹⁸⁾, Pakistan has an untapped export potential of US\$12.2 billion.

Based on the expertise of the industry of Pakistan and market demand, the export potential map of textile products of Pakistan is given in figure 30.

Figure 30. Export potential map of Pakistan for textile products ⁽²⁾



The total untapped potential in textile and clothing is about US\$7.0 billion. The major products include men's trousers and cotton shorts with a 25 per cent untapped potential, women's trousers and cotton shorts with 22 per cent untapped potential, bedlinen with 36 per cent untapped potential, toilet kitchen linen with 70 per cent untapped potential, bedlinen (knitted/crocheted) with 29 per cent untapped potential, single yarn of cotton 12 per cent untapped potential and denim with 30 per cent untapped potential.

2

TECHNICAL TEXTILE

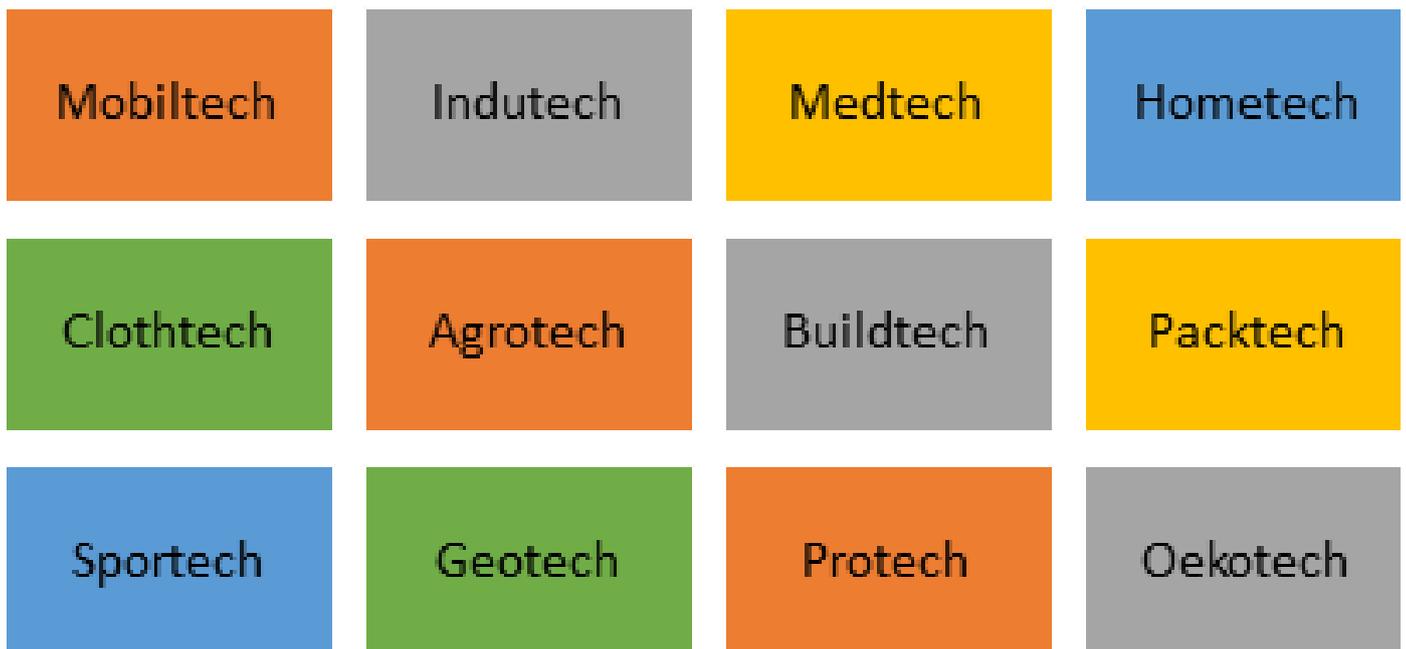
Technical textile products are used primarily for their technical performance and functional properties, whereas conventional textiles are used for the aesthetic and furnishing purposes. In comparison to US\$700 billion market of conventional textiles, which accounts for 78 per cent of the total market, the value of the technical textile market is about US\$190 billion. This can be attributed to the increasing demand for functional products in different end-use areas such as personal safety, light weight replacement materials for metals, medical and health care and industrial applications ⁽¹⁾. Technical textiles consume 22 per cent of total fibres globally.

Technical textile has a market value of about US\$190 billion and consumes 22 per cent of the total fibres globally.

2.1 Classification of technical textile with respect to area of application

With respect to its applications, technical textiles are divided into 12 main categories as shown in figure 31.

Figure 31: Classification of technical textile with respect to application



1. Protech

are the protective textiles that are used in protection against various threats such as heat and radiation for fire fighter clothing, molten metals for welders, bulletproof jackets for army and police officers and chemical materials for labourers working in the petrochemical sector. They also provide protection against bacterial and blood pollution in hospitals.

2. Sportech

are the sports textiles used mainly for making sportswear, including sports shoes and other sports accessories. Increasing interest in active sports and outdoor leisure activities such as flying and sailing sports, climbing, and cycling has led to immense growth in the consumption of textile materials related to sport goods and equipment.

3. Packtech

are the packaging textiles used for bags, packaging sacks, Flexible Intermediate Bulk Carriers (FIBC) and wrappings for textile bales and carpets, durable papers, tea bags, and other food and industrial product wrappings.

4. Oekotech

are the environmental textiles used in environmental protection applications, such as floor sealing, erosion protection, air cleaning, prevention of water pollution, water cleaning, waste treatment/recycling, depositing area construction, product extraction and domestic water sewerage plants.

5. Mobiltech

is used in the transportation industry for the production of vehicular accessories such as seat covers, seat belts, nonwovens for cabin air filtration, airbags, parachutes, inflatable boats, air balloons, truck covers and restraint which has significant textile end-uses in the transportation sector (automobiles, railways and ships). Pakistan is importing most of these textiles for locally assembled/manufactured vehicles.

6. Medtech

includes all textile structures that are designed and manufactured for a medical application. They are used in health care and hygiene applications in both consumer and medical markets. They are generally used in bandages and sutures that are used for stitching the wounds.

7. Indutech

are the industrial textiles used in different industries for functions such as separation and filtration, transportation of materials and serving as substrates for abrasive sheets and other coated products.

8. Hometech

is used in manufacturing for many home furnishing fabrics including carpet backings, curtains and wall coverings. Much of hometech consists of fire-retardant fabrics.

9. Geotech

are textile fabrics which can be woven, nonwoven or knitted fabric used for a variety of purposes such as support, drainage and separation at/or below ground level, coastal engineering, earth and road construction, dam engineering, soil sealing and drainage systems.

10. Clothtech

includes functional textile products that are most often invisible components in clothing and footwear products e.g., interlinings, sewing thread, insulating fibrefill and waddings.

11. Buildtech

is used in construction and architectural applications such as for concrete reinforcement, facade foundation, interior construction, insulation, noise prevention, visual protection, protection against sun light and building safety. The field of textile architecture is also expanding as textile membranes are increasingly being used for roof construction.

12. Agro-textiles,

also known as agrotech, are used in agricultural applications related to growing and harvesting of crops and animals. They are also used in forestry, horticulture, and animal and poultry rearing, including animal clothing.

Some examples of technical textiles products are given in figure 32.

Figure 32: Examples of application of technical textiles



Source: Tanveer Hussain, Technical Textiles, COVITEX conference, National Textile University.

2.2 Classification of technical textile with respect to technology

With respect to fabrication process, technical textiles are globally classified into composites, non-woven and woven/knitted technical textiles. These three may have application areas from one or more of 12 segments mentioned earlier.

1. Composite materials are produced by combining textile reinforcement and polymeric, ceramic or metallic matrix. Glass fibres are mostly used fibres in such materials along with matrix unsaturated polyester. Other fibres include carbon fibre, aramid fibres, high-density polyethylene (HDPE) and natural fibres like jute, hemp and linen etc.

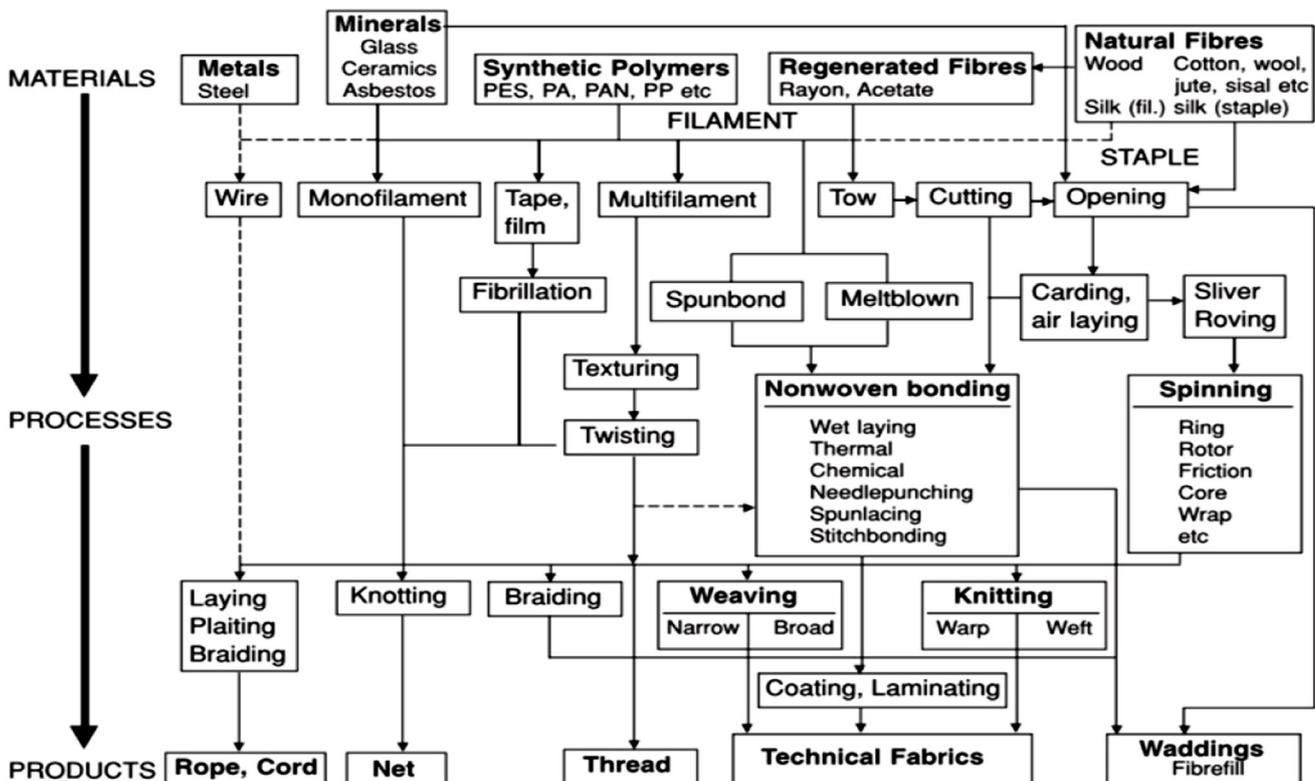
These materials have generally superior mechanical properties that have light weight and longer service lives. Composite materials have application in mobiltech, buildtech, protech etc.

2. Nonwovens are produced directly from fibres by placing them randomly in the form of sheets. The fibre bonding techniques to achieve a consolidated sheet with required thickness includes spun bond, melt blown, needle punching and thermal bonding. Polypropylene is the most used material to produce nonwoven fabric. However, these are being produced with natural fibres as well. Due to the short fabrication cycle, nonwovens are quick to produce and are relatively cheap. Nonwovens have applications in almost all the 12 application segments of technical textiles.

3. Woven/knitted technical textiles is the category that covers the majority of technical textile products. The yarn is either staple spun or is converted to fabric using knitting or weaving process. The mostly used fibres in these textiles is polyester. The fabrics are then processed and converted into end products. These have applications in almost all the 12 application segments of technical textiles.

A typical value chain of technical textiles is presented in figure 33. The map is divided into three parts called as materials, processes and products. The materials used are metallic, mineral, synthetic polymers or natural fibres in nature. They may be available in staple or in filament form. The fibres are directly converted to waddings, nonwovens, nets, ropes, cords, threads or to technical fabrics after spinning, weaving/knitting and coating.

Figure 33: Technical textile value chain from materials to end products ⁽¹⁹⁾





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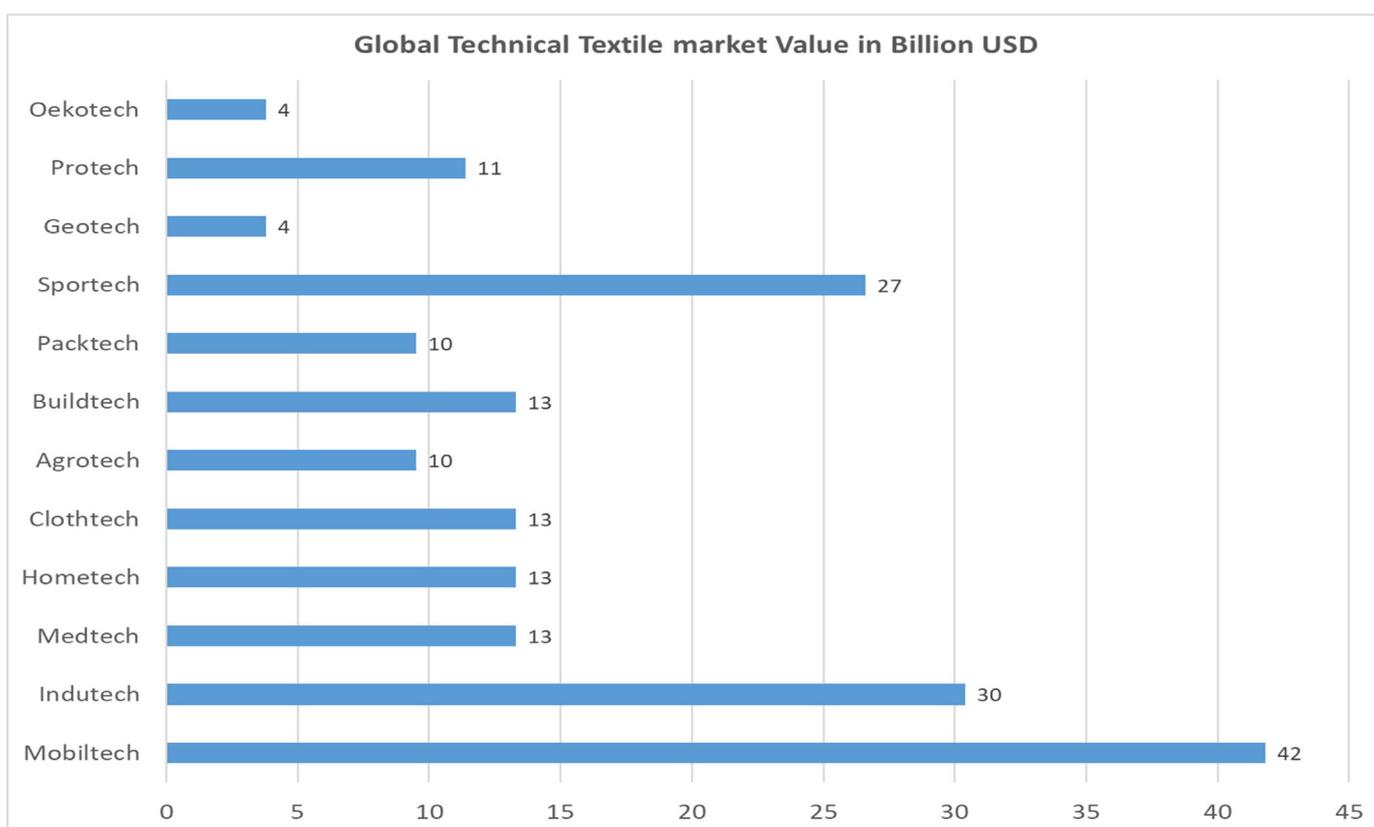
2.3 Global technical textile market

The total global market of technical textiles is estimated between US\$190-200 billion ⁽²⁰⁾. The demand for technical textiles is likely to gain traction across Asia-Pacific countries ⁽²¹⁾. Mobiltech, indutech and sportech account for 52 per cent of the total market. Europe and China together account for more than 50 per cent of the global technical textile production while India accounts for approximately five per cent of the production. Contrary to conventional textiles with a cumulative annual growth rate of one per cent the growth rate of technical textiles in the world is about 4.6 per cent. The global technical textiles market is expected to rise to US\$220 billion by 2025 ⁽²⁰⁾.

2.3.1 Market by application segment

As shown in figure 34 and figure 35, mobiltech is the biggest application segment of technical textiles with a US\$42 billion value and 22 per cent share in the global market. It is followed by indutech and sportech with a share of US\$30 billion (16 per cent) and US\$27 billion (14 per cent) respectively. These three categories account for 52 per cent of the total technical textiles market.

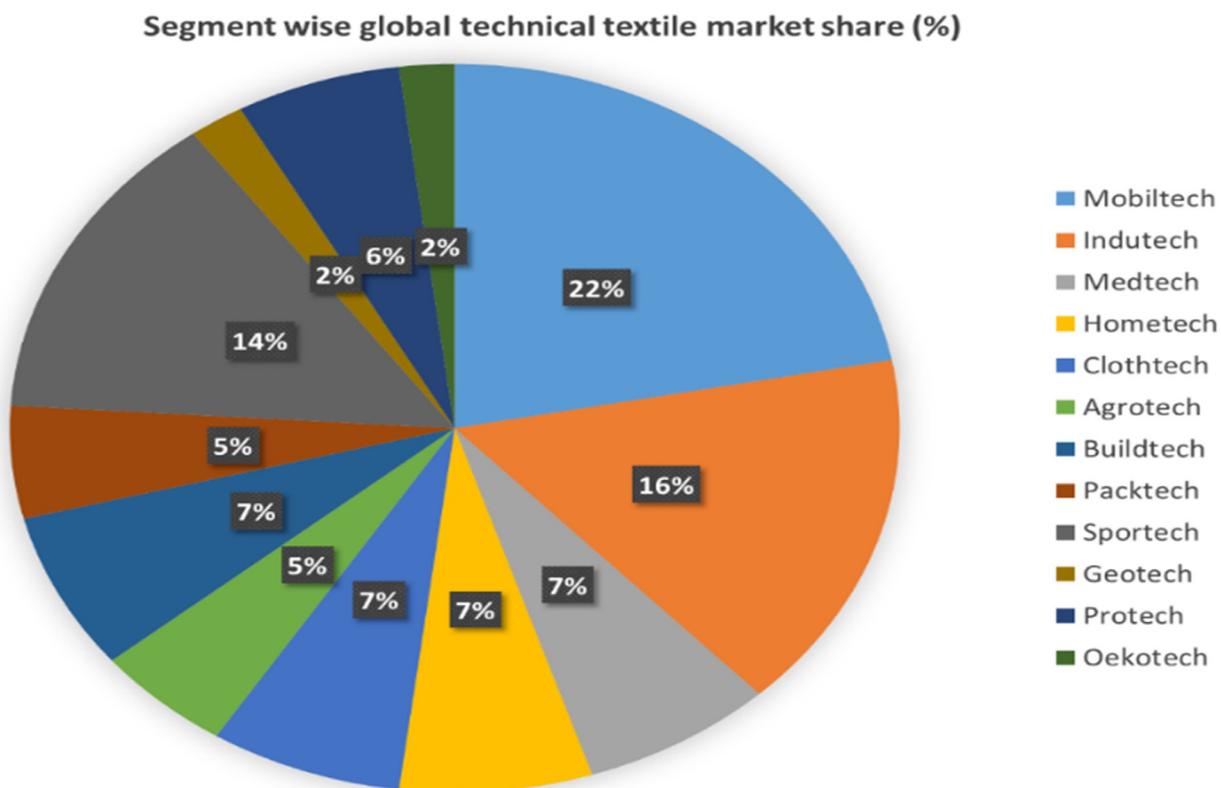
Figure 34: Category wise breakdown (value in billion US\$) of the global technical textiles market ⁽²⁾



The share of medtech, homotech, buildtech and clothtech is US\$13 billion each, which is equal to seven per cent share in the global market.

The categories packtech and protech have a market value of US\$10 and 11 billion respectively which is equal to five per cent share (each) in the market. The market value of geotech and oekotech is US\$4 billion each which is equal to two per share (each) in the market.

Figure 35: Application segment wise breakdown (%) of global technical textiles market ⁽²⁾



The categories packtech and protech have a market value of US\$10 and 11 billion respectively which is equal to five per cent share (each) in the market. The market value of geotech and oekotech is US\$4 billion each which is equal to two per share (each) in the market.

2.3.2 Market by process

Technical textiles are either produced using woven/knitted fabrics, nonwoven or composite materials. As evident from figure 36, the total volume of technical textiles produced using woven/knitted fabrics is about 60 per cent, which is much higher than the combined volume of nonwoven and composites (20 per cent each).

The total volume of technical textiles produced using woven/knitted fabrics is about 60 per cent.

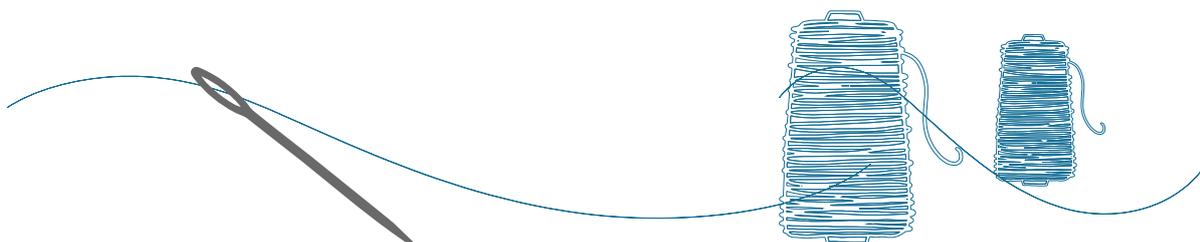
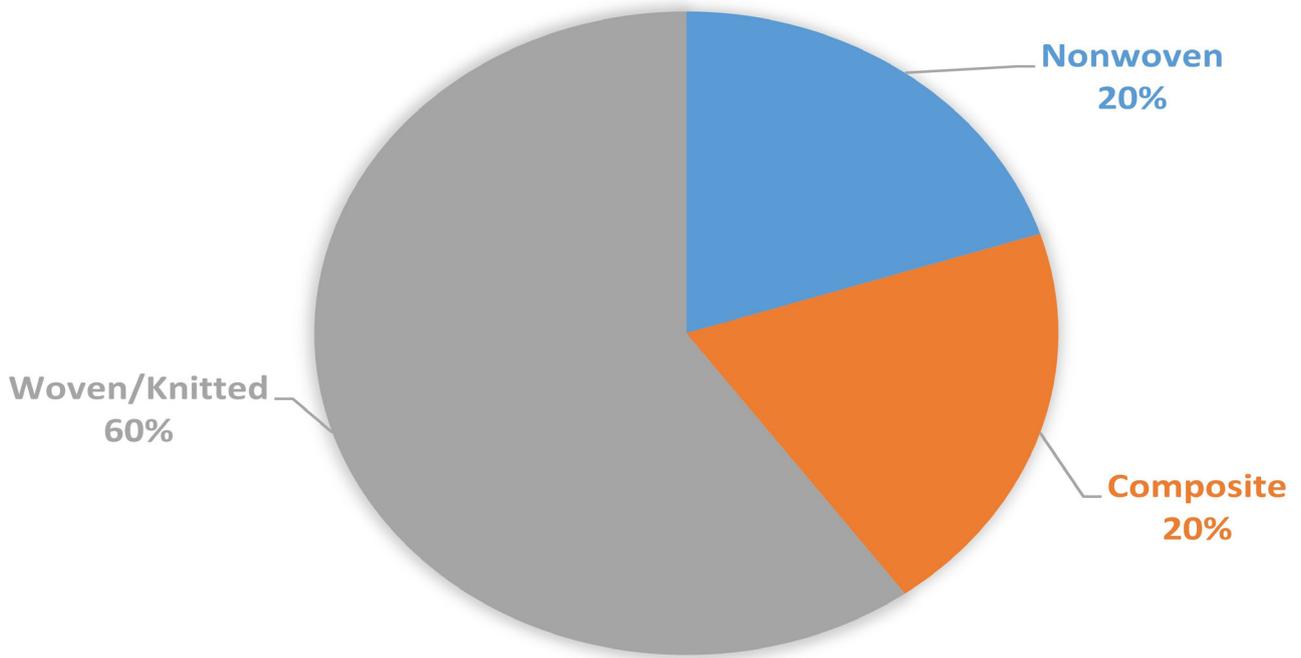


Figure 36: Category-wise (%) of global technical textiles market ⁽²⁾

Technical textile market (volume) share



2.3.3 Market by region

Most of the technical textiles (88 per cent by volume) are being used in America, Europe and Asia Pacific (figure 37). The share of Asia Pacific region has significantly increased during the last decade. The main reason of increasing share of this region is a steady growth of the Chinese market and an emerging Indian market.

Figure 37: Region-wise breakdown (%) of global technical textiles market ⁽²⁾



After a careful analysis, it can be concluded that China is the largest exporter of technical textiles globally. Other key players include USA, Germany and Vietnam. The biggest importer of technical textiles is USA. Other key markets include Germany, China, Japan and Vietnam etc.

2.3.4 Global market drivers

The major drivers of market growth of technical textiles are listed in table 7. The main drivers include an improvement in life-style, growth in population, awareness and technological advancements.

Table 7. Global market drivers for technical textiles

Segment	Drivers
Transport	Auto Sector growth, need to reduce weight, demand for environmental issues and end of life cycle features
Industrial	Industrial growth
Agro	Benefits in terms of improved productivity and reduced need for chemicals
Construction	Building Safety and health of stakeholders, Emergency Shelters
Geo textiles	Acceptance of benefits
Clothing	Growth in garment sector – will shift from region to region
Home	Growth in the sector, Population growth
Protective	Awareness of Health and Safety at workplace
Medical	Concern for environment, Innovation
Military	Modernization of armed forces
Sports	Need for high performance apparel
Packaging	Environmental needs and increase in 3Rs

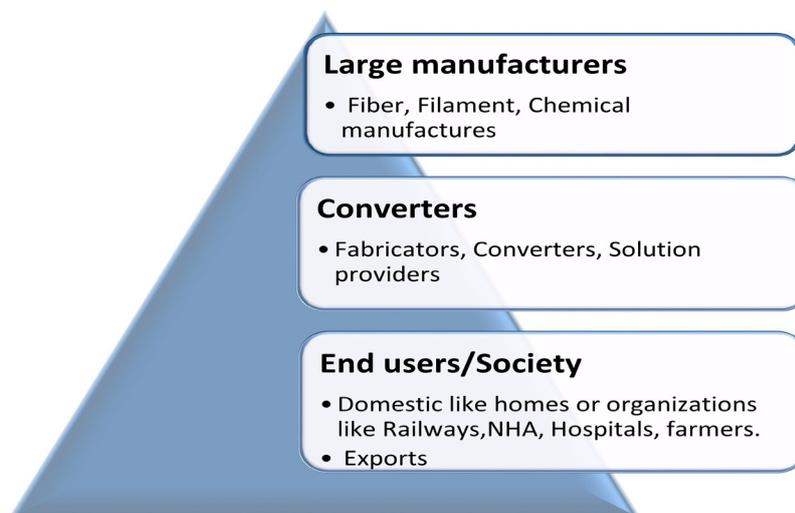
2.4 Pakistan's technical textile market building blocks

There are three major building blocks of the technical textile market in Pakistan, namely large manufacturers, converters and end users/society as shown in figure 38. The material/large scale manufactures are few in Pakistan in comparison to other countries globally that are leading in technical textiles.

Most of the companies in Pakistan lie in the category of “converters”. They procure raw material, e.g. fibre, yarn or fabric and convert it into the final product.

The end user includes local and export market. The local end users are not relatively aware of the importance and benefits of the technical textiles and there has never been an organized campaign to create awareness regarding its significance. Furthermore, the main focus of the converters is the export market due to better profit margins.

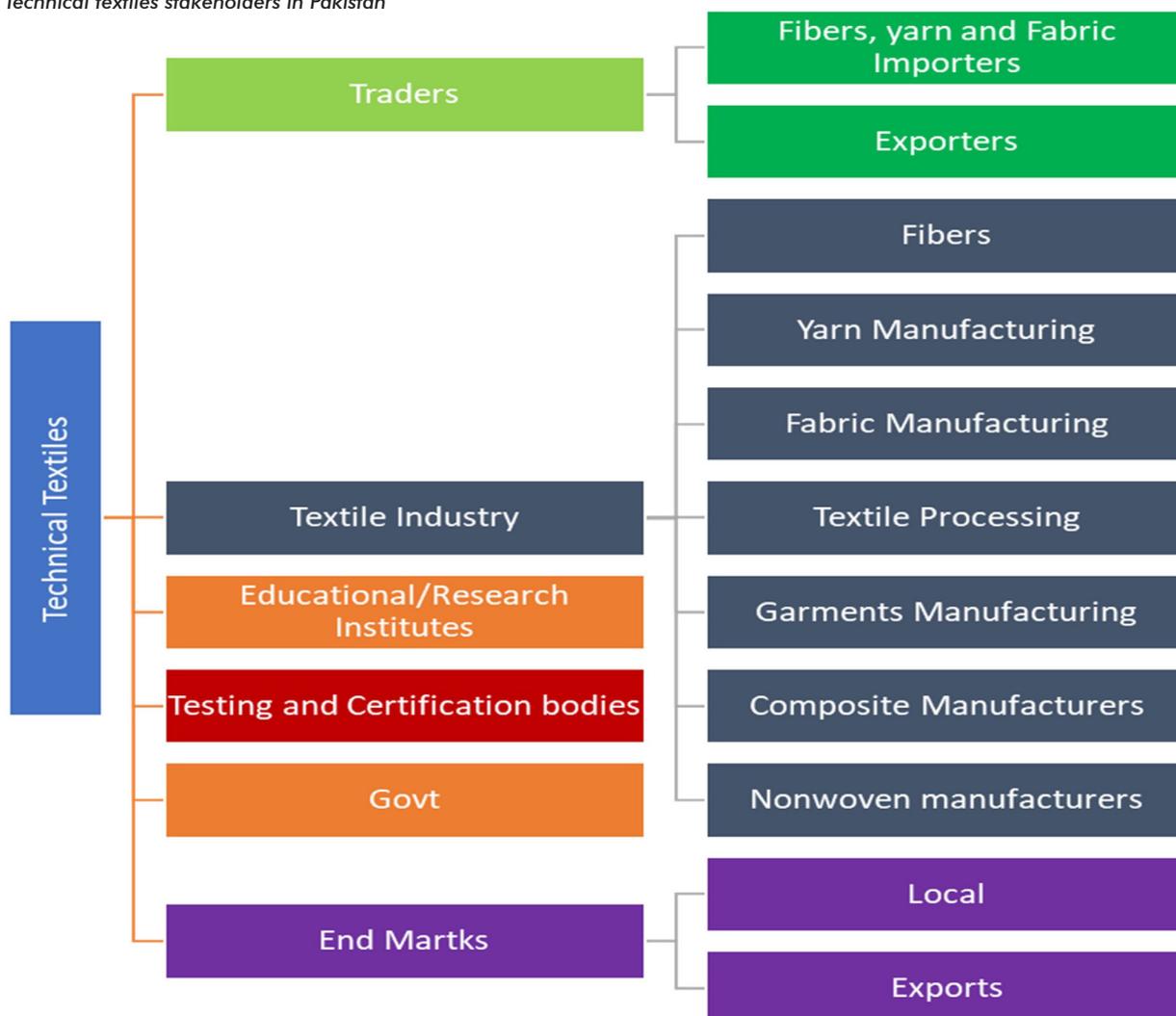
Figure 38: Building blocks of technical textiles market in Pakistan



2.5 Stakeholders of technical textile market in Pakistan

The major stakeholders involved in the technical textiles in Pakistan are given in figure 39.

Figure 39: Technical textiles stakeholders in Pakistan



2.6 Pakistan's technical textiles value chain (process wise) mapping

More than 200 companies manufacture technical textiles, composites and nonwovens in Pakistan. These producers are generally small and medium sized companies, but there are also some large-scale companies producing technical textiles as well.

2.6.1 Value chain map

A simple, self-explanatory value chain map for technical textiles in Pakistan is given in figure 40.

Figure 40: Technical Textile Manufacturing Value Chain in Pakistan

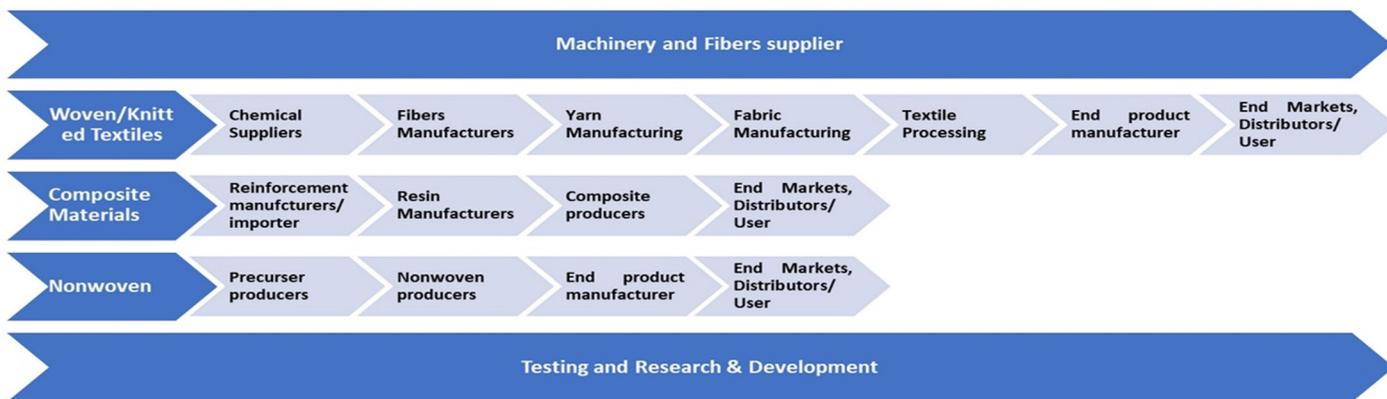
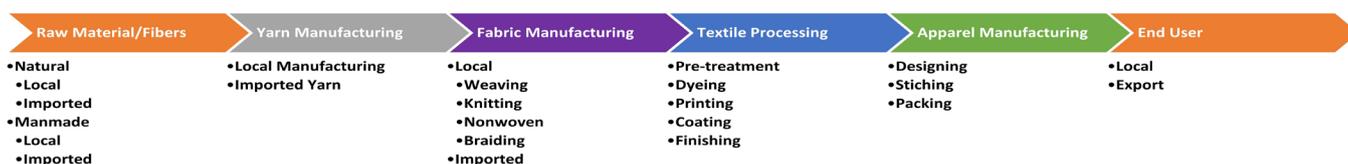


Figure 41: A detailed value chain map of woven/knitted technical textile manufacturing in Pakistan



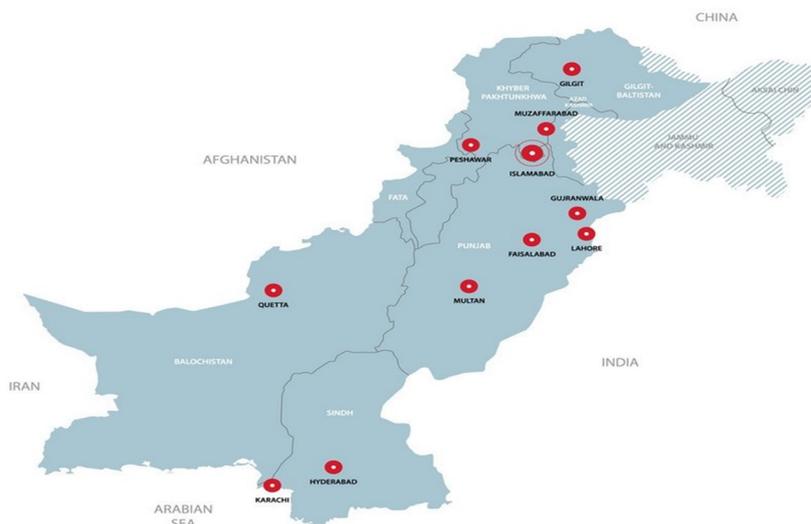
2.6.2 Major technical textile producers in Pakistan

In Pakistan, there are two types of technical textile industries: dedicated/specialized technical textile industry clusters and conventional textile industry producing technical textiles as well.

Technical textile industry exists in Pakistan as small industrial clusters of SMEs in Sialkot, Gujranwala, Faisalabad, Lahore and Karachi.

The conventional textile industries of Pakistan (large-scale industries and SMEs) are producing technical textiles as well by diversifying their products, dealing with health care textiles, protective textiles and packaging textiles etc. These industries are mainly based in Faisalabad, Lahore, Multan, Karachi etc. The locations of technical textile industries are shown in figure 42. Technical textile represents woven/knitted technical textiles.

Figure 42: Location of technical textile industry in different regions in Pakistan (2)

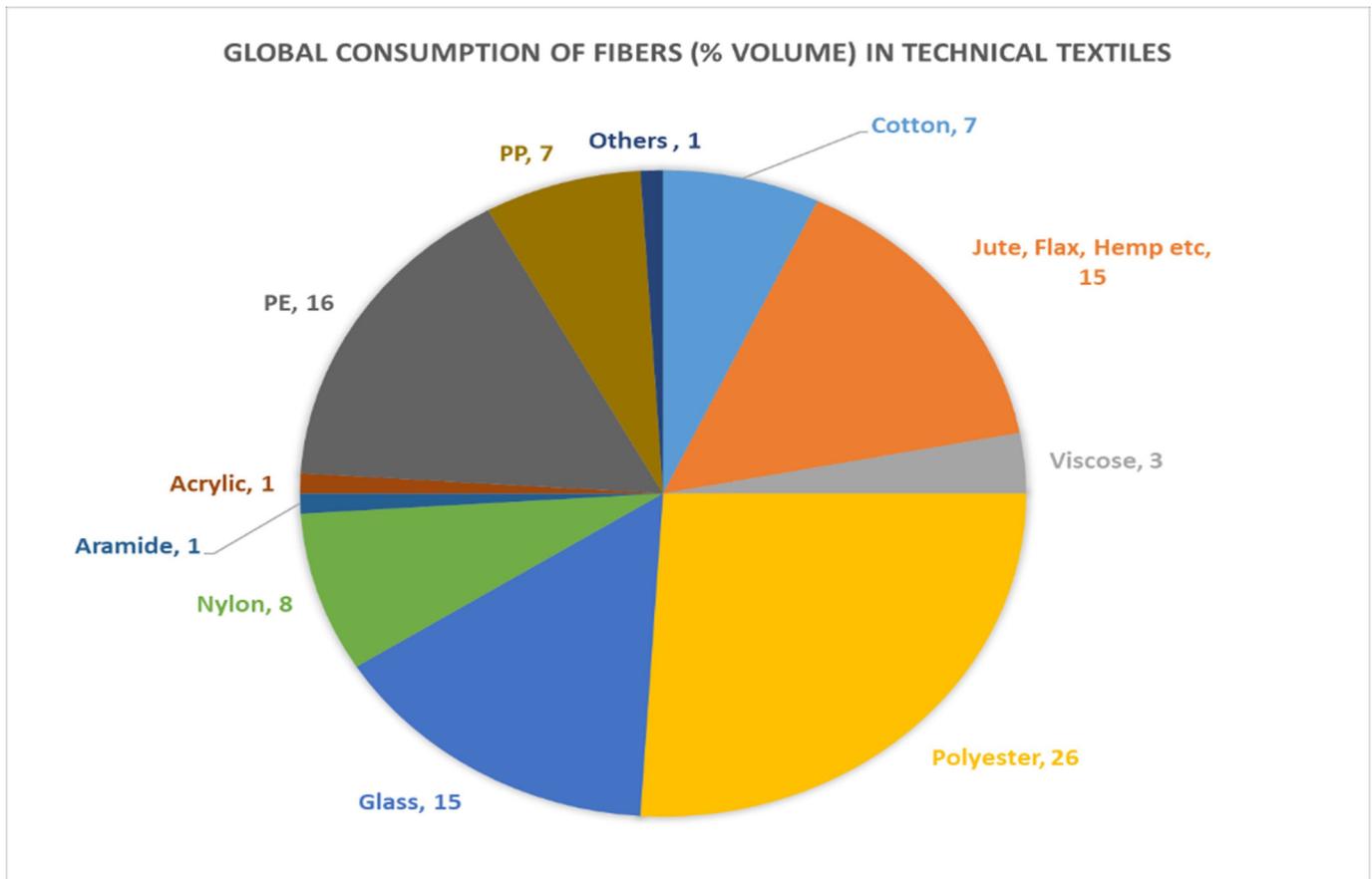


2.6.2.1 Technical fibres and raw materials

Several natural and man-made fibres are being used in technical textiles. The total demand is increasing at a significant rate of four per cent annually and has become 33.3 million tonnes in 2020.

The global consumption ⁽²²⁾ of fibres for technical textiles is given in figure 43. Polyester is the leading fibre with a volume share of 26 per cent followed by glass and nylon. In natural fibres cotton is leading with a share of seven per cent whereas jute, hemp, flax etc. have a cumulative share of 15 per cent. In technical textiles, the share of man-made fibres is about 78 per cent.

Figure 43: Global consumption of fibre for technical textiles ⁽²⁾



In terms of global consumption of fibres for technical textiles, polyester is the leading fibre with a volume share of 26 per cent followed by glass and nylon.

The list of main natural, manmade and high-performance fibres and their properties are given in table 8.

Table 8: Properties of natural fibres ⁽²³⁾

Plant fiber	Tensile strength (MPa)	Young's modulus (GPa)	Specific modulus (GPa)	Failure strain (%)	Density (kg/m ³)	Moisture content (Eq.) (%)
Cotton	300-700	6-10	4-6.5	6-8	1550	8.5
Hemp	310-750	30-60	20-41	2-4	1400-1500	12
Jute	200-450	20-55	14-39	2-3	1300-1500	12
Hemp	310-750	30-60	20-41	2-4	1400-1500	12
Flax	500-900	50-70	34-48	1.3-3.3	1400-1500	12
Silk	650-750	16	12.5	10-25	1300-1380	11

Manmade fibers

fiber	melting pt. (°C)	Softening point (°C)	Tensile strength (cN/tex)	Young's modulus (cN/tex)	Failure strain (%)	Density (kg/m ³)
Viscose	175-205		15-30	8-12	15-30	1520
Polyester	480	460	40-60	800-1000	10-20	1220-1380
Nylon 6.6	255-260	235	40-60	20-35	20-30	1310
Nylon 6	215-220	170	40-60	15-35	20-40	1140
PE	125-135		32-65	15-30	10-45	950-960
PP	160-175		15-60	13-15	15-200	900

High performance fibers

fiber	Tensile strength (MPa)	Young's modulus (GPa)	Failure strain (%)	Density (kg/m ³)
E-Glass	1800	69-73	4.7	2500
Carbon	2400-3400	230-380	1.76	1750-1950
Aramid	3000	130	3.2-3.8	1450
High density PE	2900-3200	140	3	940

The total demand of technical textile is increasing at a significant rate of four per cent annually and has become 33.3 million tonnes in 2020.

The list of fibres, their type, and their use in different domains of technical textiles is given in Table 9.

Table 9: Use of fibres in technical textiles ⁽²⁾

Fiber		Mobiltech	Indutech	Medtech	Hometech	Clothtech	Agrotech	Buildtech	Packtech	Sportech	Geotech	Protech	Oekotech
Natural	Cotton	✓	✓	✓	✓	✓		✓	✓	✓			
	Jute	✓						✓	✓	✓	✓		
	Hemp	✓						✓	✓	✓			
	Flax	✓						✓	✓	✓			
	Silk			✓	✓	✓							
Manmade	Viscose	✓			✓	✓							
	Polyester	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Nylon	✓	✓	✓		✓				✓		✓	✓
	Aramid		✓							✓		✓	
	High Density PE		✓							✓		✓	
	Acrylic	✓	✓	✓	✓			✓		✓			✓
	Polypropylene (PP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Pakistan's spinning industry is mainly designed for spinning of staple natural fibres or their blends with man-made fibres.

There are 11 types of natural and synthetic fibres used in technical textiles (their HS codes given in the table below). Only 02 out of these 11 are locally produced in Pakistan, and their import quantity is valued at nearly US\$1.1 million. These fibres are partially or completely used in the production of technical textiles, the details of which are given in Table 10.

Table 10: Local production in Pakistan and staple fibre import in 2019 ⁽²⁾

Fibers (staple)		HS Code	Local Production		Import		Total Consumption		Use in Technical Textiles
			Tons	Thousand USD	Tons	Thousand USD	Tons	Thousand USD	Partial/Complete
Natural	Cotton	5201	1,655,000	2,330,240	418,607	709,510	2073607	3039750	Partial
	Jute	5305			40830	23612	40830	23612	Complete
	Hemp	5302			5	18	5	18	Complete
	Flax	5301			649	1765	649	1765	Partial
	Silk	5002			177	2,865	177	2865	Partial
Synthetic	Viscose	550410			178,173	293,772	178173	293772	Partial
	Polyester	550320	541178	600,647	85,433	94,821	626611	695468	Partial
	Nylon	550319			366	1971	366	1971	Complete
	Aramid	550311			1,758	13,188	1758	13188	Complete
	Acrylic	550330			7734	16,609	7734	16609	Partial
	Polypropylene (PP)	550340			2	19	2	19	Partial
Total			2,196,178	2,930,887	733,734	1,158,150	2,929,912	4,089,037	

It can be noted that cotton and polyester are the two major fibres produced in Pakistan. The total quantity of these fibres produced is equal to 2.1 million tonnes having a worth of US\$2.9 billion. Pakistan imports 733,734 tonnes of fibres worth US\$1.15 billion. Cotton, viscose, polyester and aramid are the major imported fibres. The first three are only partially used in technical textiles whereas aramida is completely used to produce yarn for technical textiles.

2.6.2.2 Process wise mapping of the technical textile industry in Pakistan

The process wise mapping of the textile industry of Pakistan is given in table 11. Application area, location of factories, type of their business etc. are also given in the same table.

Table 11: Process wise mapping of technical textile value chain in Pakistan

Segment (Process)	Subcategory	Segment (Application)	Number of Factories		Location (Zone)	Export		Local
			Large scale	SME				
Fibers	Synthetic	All	x		Faisalabad, Lahore, Karachi	✓		✓
Yarn Spinning	Natural	PackTech, Protech, MedTech, Homotech	xxxx		Faisalabad, Lahore, Multan, Karachi	✓		✓
	Synthetic	All	xx		Faisalabad, Lahore, Karachi	✓		✓
Fabric Manufacturing	Woven	All	x	xxx	Faisalabad, Lahore, Multan, Karachi	✓		✓
	Weft knitting	All		xxxx	Faisalabad, Lahore, Multan, Karachi	✓		✓
	Warp Knitting	Agro Tech, Buildtech		xx	Gujranwala, Karachi			✓
	Nonwoven	All	x	x	Faisalabad, Lahore, Peshawar, Karachi	✓		✓
	Braiding	Indutech		x	Faisalabad			✓
Composite Materials	Low Tech	Buildtech		xxxx	Faisalabad, Lahore, Sialkot, Karachi			✓
	Medium Tech	Sportech		xxx	Lahore, Sialkot	✓		✓
	High Tech	Sportech, Mobiltech	x		Islamabad, Lahore	✓		
Textile Processing	Dyeing, Printing	All	xxxx	xxxx	Faisalabad, Lahore, Multan, Karachi	✓		✓
	Coating	All	x	x	Faisalabad, Lahore, Karachi	✓		✓
Garments/ Stitching			xxx	xxxx	Faisalabad, Lahore, Sialkot, Multan, Karachi	✓		✓

Less than 10 = x, 11-20 = xx, 21-50 = xxx, more than 50 = xxxx

2.6.3 Composite industry in Pakistan

The composite industry in Pakistan has an estimated market value of US\$200 million. The industry mainly functions to meet local needs of composite materials, especially glass fibre reinforced composites. The industry exports composite sports equipment such as hockey sticks and rackets etc. worth US\$15 million. Most of the industry produces shelters, protection sheets of glass/polyester using hand lay-up technique which is considered a low-tech fabrication. Compression molding, vacuum infusion, resin transfer, pultrusion and filament winding etc. are used for fabrication of other applications as listed in table 12. These are considered as medium-high tech keeping in view the sophistication of fabrication involved.

Table 12: Composite industry of Pakistan

Sr.	Industry	Region	Technology Level
1	Sports Equipment	Sialkot, Lahore	Medium-High
2	Fiber Reinforced Plastics	Whole Pakistan with major clusters in Lahore, Faisalabad, Karachi, Rawalpindi	Low
3	Aerospace	Islamabad, Lahore	High
4	Automobile	Lahore, Karachi, Faisalabad	Medium-High
5	Defense Industry	Islamabad	High
6	Doors, windows, furniture	Lahore, Karachi	Medium-High

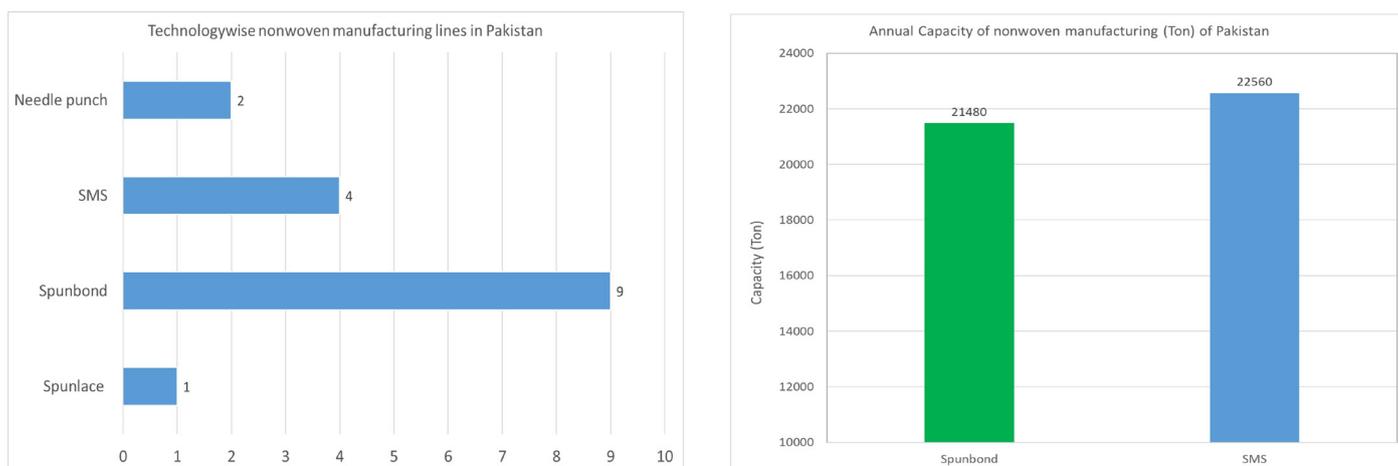
2.6.4 Nonwoven industry in Pakistan

Pakistan's nonwoven industry is not very big in size and there are about 15-20 manufactures producing nonwoven for local as well as the export market. The major raw material used is polypropylene and the main fabrication techniques include needle punch, spunbond and spunbond-meltblown-spun bond (SMS) technique.

Most of the factories are producing spunbond nonwoven for hygiene, packaging products etc. Due to the increased demand of masks, gowns etc. during COVID 19, there was a trend of installation of meltblown nonwoven technology. At present, the nonwoven industry of Pakistan is not only meeting local demand, but also contributing to exports as well. The number of spunbond manufacturing lines are about nine, followed by SMS which is four in number (figure 44).

The total annual capacity of spunbond and meltblown nonwoven is 21,480 and 22,560 tonnes respectively.

Figure 44: Nonwoven manufacturing lines installed in Pakistan and their capacity (tonnes)



2.7 Educational and technical textile research institutes

Following are some research institutes which work on technical textile projects:

2.7.1 National Textile University Faisalabad

Ever since its inception National Textile University (NTU) has been the premier institute of textile education in the country,

meeting the technical and managerial human resource needs of almost the entire textile industry of Pakistan. It always retained a close relationship with the industry and industrialists. National Textile University has been serving the Pakistani textile industry since almost half a century. It has dedicated research facilities to diverse research fields, including coated textiles, medical textile, geo textile, packtech, agrotech, protective textiles, nonwoven and composite materials.

NTU is the only university in Pakistan offering undergraduate as well as MS and PhD degree in textile engineering with specialization in technical textiles. NTU has following dedicated research centers for research on technical textiles:

1. Pak-Korea Technical Textile Research Centre
2. National Centre for Composite Materials
3. Nanotechnology Research Centre
4. Nonwoven Research Centre
5. National Textile Research Centre



These centres are well equipped with product development and testing facilities.

2.7.2 NED University of Engineering and Technology

NED University situated in Karachi is the highest ranked university in Pakistan. It has a textile engineering department, which has a research focus on technical textiles. Technical textile subjects are also offered and students are encouraged to do research in the field of technical textile. Many technical textile fields like sportech, agrotech and medical textile projects are ongoing.

2.7.3 Mehran University of Engineering and Technology

The department of textile engineering has state-of-the-art machinery for processing of yarns, fabrics and their dyeing/finishing along with various textile testing machines and processes, operated under supervision of highly qualified PhD Professors and lab staff. It has many master and bachelor level research projects in the field of technical textile. Medical gloves, geo fabrics and industrial covering fabrics structures and designs are initiated at this department.

2.8 Ministry of Commerce and Textile Policies

Ministry of commerce-textile division deals with the textile industry of Pakistan and is responsible for policy making. Though there is not a clear segregation between conventional and technical textiles in Pakistan, still in the Textile Policy 2014-19, there was an emphasis on technical textiles. This section will cover the government's existing policy on technical textiles and facilities they are offering to strengthen this sector in Pakistan. Two textile policies have been announced in Pakistan for 2009-14 and 2014-2019. Both the policies recognize that technical textile is an opportunity that Pakistan must exploit. Abstract description of these policies is given below.

2.8.1 Textile policy 2009-14 ⁽²⁴⁾

In this policy, the government aimed to develop a proper strategy for the promotion of technical textiles in the country

"8.13 Technical Textiles: Technical textiles is an emerging area of high value addition, where given our strength in heavy clothing; we can claim a significant portion of the world market share. However, there is a need to invest in R andD in this area. The government will develop a proper strategy for the promotion of technical textiles in the country. For this purpose, an exclusive centre of excellence to impart training, develop skills and provide relevant information about the trends in the world pertaining to such fields like geotech, meditech and sportech, will be established".

2.8.2 Textile policy 2014-19 ⁽³⁴⁾

Textile policy 2014-19 had three dedicated sections for technical textiles, where the government aimed to develop strategy for promotion of technical textiles:

10.8 Technical Textiles

10.8.1 Technical textiles are an emerging area of high value addition and through concerted efforts we can gain significant share in the world market. However, there is a need to invest in R and D in this area. The government will develop a proper strategy for the promotion of technical textiles in the country. For this purpose, an exclusive centre of excellence to impart training, develop skills and provide relevant information about world trends in such fields like geotech, meditech and sportech will be established. The government will pursue the KOICA who has shown interest in establishing a research facility for technical textiles in National Textile University, Faisalabad. The non-woven sector is one of the emerging sub-sectors having considerable share in value-added products. To encourage this sector, training modules will be developed to impart knowledge and skills."

12.4 National Textile University

12.4.1 The National Textile University (NTU) will continue to provide higher education and will increase the number of PhDs to meet the skill gap in research and development. NTU will be encouraged to establish departments for technical textiles in collaboration with foreign donor agencies, and also to set up a department for textiles dyes, pigments and finishing to support dyes and chemical manufacturing in the country."

13.2 To achieve the objectives, strategic master plans will be developed particularly for export promotion, SME development, technical textiles and sub-sectors."

2.9 Testing of technical textiles

Technical textiles products are designed to perform a particular function. The testing required for a technical textile is more comprehensive as compared to the conventional textiles. No dedicated test methods exist for technical textiles therefore, the test methods available in ISO, ASTM, AATC, DIN etc. are used.

The materials used in technical textile products may be in the form of fiber, yarn, fabric or composite. The assessment of both raw materials as well as the final product is necessary to meet the quality standards. Testing is carried out to evaluate the functionality and performance of the required products. Common testing of fiber, yarn and fabric are listed below:

The testing required for a technical textile is more comprehensive as compared to the conventional textiles.

Table 13. Major tests and test standard required for testing of technical textiles ⁽²⁶⁾

Sr.	Textile Property	Test Standard	Equipment used
1.	Static charge test	BS EN 1149-1	Conductivity Tester
1.	Limiting oxygen index test	ISO 4589-1, ASTM D 2863	LOI tester
1.	Hydrophobicity	ASTM F22	Contact angle tester
1.	Flame retardancy	ISO 6940, ASTM D 6413	Flammability tester
1.	Stab resistance	NIJ standard 0115.00, ISO 13997	Stab resistance tester
1.	Cut resistance	EN388, ISO 13997	Cut resistance tester
1.	Bullet resistance	NIJ. Standard 0101.06	-
1.	Filtration	ISO 16890	HPLC
1.	Weather resistance	M025A	Weathering tester
1.	Antimicrobial activity	AATCC 100, AATCC 147	Agar diffusion
1.	Impact testing	EN388	Impact tester
1.	Fatigue testing	ASTM F963	Fatigue tester
1.	Stretch and recovery	ASTM D3107	extensometer
1.	UV/Sun Protection Factor Test	AATCC 183	UV protection tester
1.	UV resistance	ASTMD 4355	Xenon arc apparatus
1.	Water Resistance of Fabric	ISO 811, AATCC 127	Hydrostatic Head Tester
1.	Water Repellency Test	AATCC 22	Spray tester
1.	Protective clothing for Cold protection	EN342	Thermal manikin
1.	Chemicals protection	EN 465,466	-
1.	Electric hazard	EN 1149	Electric hazard testing machine
1.	High visibility material	EN 471	
1.	Mechanical impact testing	EN 510	Impact Tester
1.	Radioactive contamination	EN 1073	Nuclear shield radiation
1.	Thermal hazard	TS 50354	Thermal tester
1.	Protective glove against mechanical risk	EN 388	CUT test machine, tensile machine
1.	Protective gloves against cold	EN 511	Cold contact tester
1.	Body protection for sports	EN 13227	High pressure test manifold
1.	Bursting strength	ISO 13938	Bursting strength tester
1.	Puncture resistance testing	ASTMD 4833	Compression testing machine
1.	Friction resistance	ASTMD 5321	Pendulum skid resistance tester
1.	Trapezoidal tear	ASTMD 4533	Trapezoid Tear tester

These are the following institutes in Pakistan for testing of technical textile yarns, fabrics and made-up (final products from textile fabric other than apparels such as pillow covers, curtains, bedsheet cover etc.) .

2.9.1 National Textile University (NTU) Faisalabad

National Textile University is working on technical textiles and accommodates well-furnished lab facilities for its manufacturing as well as testing.

2.9.2 Société Générale de Surveillance (SGS)

SGS offers testing services for technical textiles to verify material characteristics for application trials, detect defects, analyze failures, improve new materials or conduct basic research on the theoretical strength of materials. SGS material testing services offer comprehensive testing for metals, polymers, and industrial lubricants. They also offer a broad range of mechanical, physical, chemical and non-destructive testing methods.

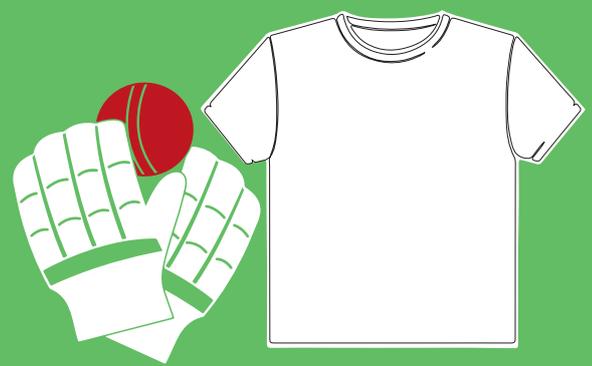
2.9.3 TTI testing laboratories

TTI is a globally recognized ISO/IEC 17025 accredited testing facility and ISO/IEC 17020 accredited inspection body in Pakistan. TTI has a countrywide network of labs and customer centers, including a state-of-the-art purpose-built main testing facility in Lahore, followed by the liaison offices in Karachi, Faisalabad, and Sialkot.

2.10 Textile associations

There is no dedicated industrial association dealing with technical textiles in Pakistan. However, depending upon nature of the business, technical textile industries are members of the following associations:

1. All Pakistan Textile Mills Association
2. Pakistan Readymade Garments Manufacturers and Exporters Association
3. Pakistan Gloves Manufacturers and Exporters Association
4. Pakistan Canvas and Tents Manufacturers and Exporters Association
5. Pakistan Sports Goods Manufacturers and Exporters Association
6. Pakistan Textile Exporters Association



2.11 Trade analysis of technical textiles

The total trade volume of technical textiles in 2019 in the world was equal to US\$211 billion. Pakistan's share in exports was equal to US\$455 million which accounts for 0.215 per cent. At the same time Pakistan imported about US\$313 million worth of technical textiles in 2019.

2.11.1 Category wise analysis

As discussed earlier, application wise, there are 12 categories of technical textiles. The total trade volume in these categories is about US\$176 billion. Pakistan's export share in this volume is 0.25 per cent, which is about US\$448 million. At the same time Pakistan imports about US\$196 million in these categories as shown in table 14.

In addition, there is a trade volume of US\$35.5 billion for technical fibers, yarns and fabrics. In this sector, Pakistan exported goods worth US\$7.0 million in 2019, which is 0.02 per cent of the total volume. Moreover, in the same category, Pakistan imported goods worth US\$117.5 million (Table 15).

Table 14. Category wise global market of technical textiles and Pakistan's exports and imports in 2019 ⁽²⁾

Category	HS Codes	Global trade (thousand USD)	Pakistan's export (thousand USD)	% (share) of global trade	Pakistan's import (thousand USD)
Agrotech	560750, 560790, 560749, 560721, 560729, 560741	2,294,300	1,409	0.06	4,790
Buildtech	5905, 5904, 630612, 630619, 630622, 630629, 630630, 680610	6,320,026	72,819	1.15	2,837
Clothtech	5807, 9607, 5806	7,953,182	12,585	0.16	45,426
Hometech	940429	2,608,384	22	0	203
Indutech	401012, 680510, 5910, 5909, 900110	5,817,238	227	0	16,608
Medtech	3005, 9619, 300610, 611510, 630790	42,953,316	89,786	0.21	68,629
Mobiltech	5703, 590210, 590290, 870821, 590220, 940110, 940120, 870895	27,796,026	1,217	0	29,394
Oekotech	591190	2,807,938	1,816	0.06	1,959
Packtech	420212, 420222, 420292, 420292, 420222, 6305	42,659,668	62,395	0.15	16,844
Protech	6114, 611610, 6210, 630720, 6113, 8804	21,700,679	161,301	0.74	3,391
Sportech	5608, 6112, 6306, 8801, 401590, 630630, 630640, 630690, 890310, 940430	12,828,233	44,283	0.35	6,207
Total		175,738,990	447,860	0.25	196,288

Table 15. Global market of technical fibers, yarns and fabrics and Pakistan's exports and imports in 2019 ⁽²⁾

Category	HS Codes	Global trade (thousand USD)	Pakistan's export (thousand USD)	% (share) of global trade	Pakistan's import (thousand USD)
Technical fibers	550311, 5303, 550340, 5305, 550319	6,722,286	2	0.00%	40,078
Technical yarns	540219, 5404, 530890 701919, 540220, 560410, 560490, 540211, 540219, 540211, 540220, 701912, 681510, 530710, 681510, 540310	16,186,546	508	0.00%	14,987
Technical fabrics	5903, 591110, 5910, 5907,	12,530,905	6,526	0.05%	62,443
Total		35,439,737	7,036	0.02	117,508

Grand total	All HS code of table 14 and 15	211,178,727	454,896	0.215	313,796
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2.11.1.1 Agrotech

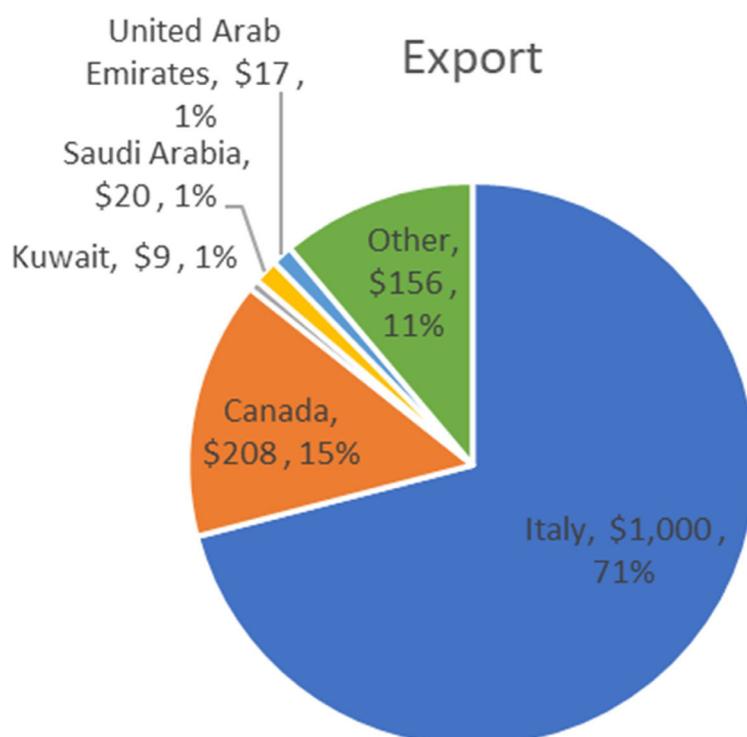
There are six main HS codes in this category as given in table 16. Pakistan is a net importer in this category. Pakistan's total imports in this category in 2019 were US\$4.79 million whereas exports were worth US\$1.409 million.

Table 16. HS codes of main products included in Agrotech category

HS code	Product description
560750	Twine, cordage, ropes, cables; of synthetic fibres other than polyethylene or polypropylene, whether or not plaited, braided or impregnated, coated, covered or sheathed with rubber or plastics
560790	Twine, cordage, ropes, cables; of materials n.e.c. in heading no. 5607, whether or not plaited, braided or impregnated, coated, covered, or sheathed with rubber or plastics
560749	Twine, cordage, ropes, cables; of polyethylene or polypropylene (excluding binder or baler twine), whether or not plaited, braided or rubber or plastic impregnated, coated, covered or sheathed
560721	Twine; binder or baler twine, of sisal or other textile fibres of the genus agave
560729	Twine, cordage, ropes, cables; of sisal or other textile fibres of the genus agave (excluding binder or baler twine), whether or not plaited, braided or rubber or plastic impregnated, coated, covered or sheathed
560741	Twine; binder or baler twine, of polyethylene or polypropylene

Pakistan's major exports in this category were to Italy (71 per cent) under HS code 560790 as shown in figure 45.

Figure 45: Pakistan's agrotech export (thousand US\$) to world ⁽²⁾



HS code 560790: "Twine, cordage, ropes, cables; of materials n.e.c. in heading no. 5607, whether or not plaited, braided or impregnated, coated, covered, or sheathed with rubber or plastics" account for 98 per cent of exports. Pakistan's major imports in this category were from China (47 per cent), Iran (16 per cent) and India (10 per cent).

The major import in this category is of HS code 560749 (53 per cent), followed by HS code 560750 (18 per cent), HS code 560741 (17 per cent) and HS code 560790 (11 per cent) as shown in figure 46.

Figure 46: Pakistan's agrotech import (million US\$) from the world, product wise breakdown ⁽²⁾

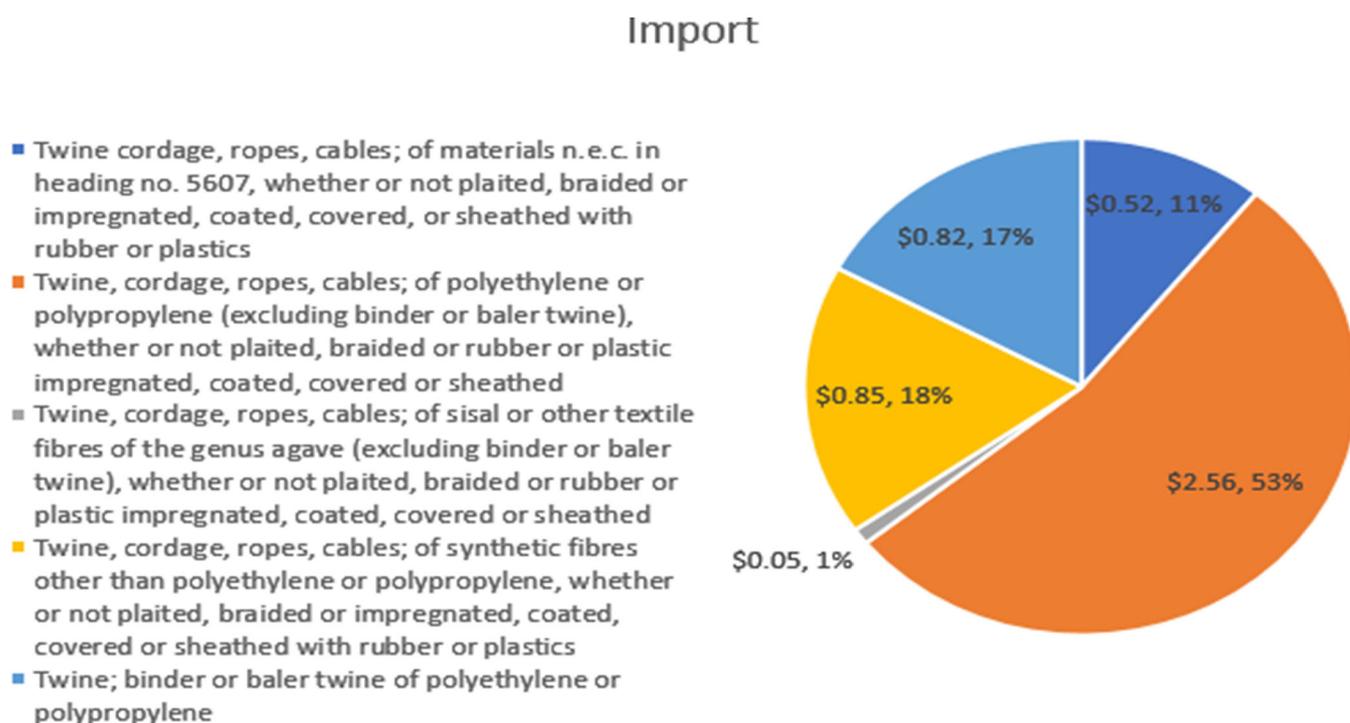
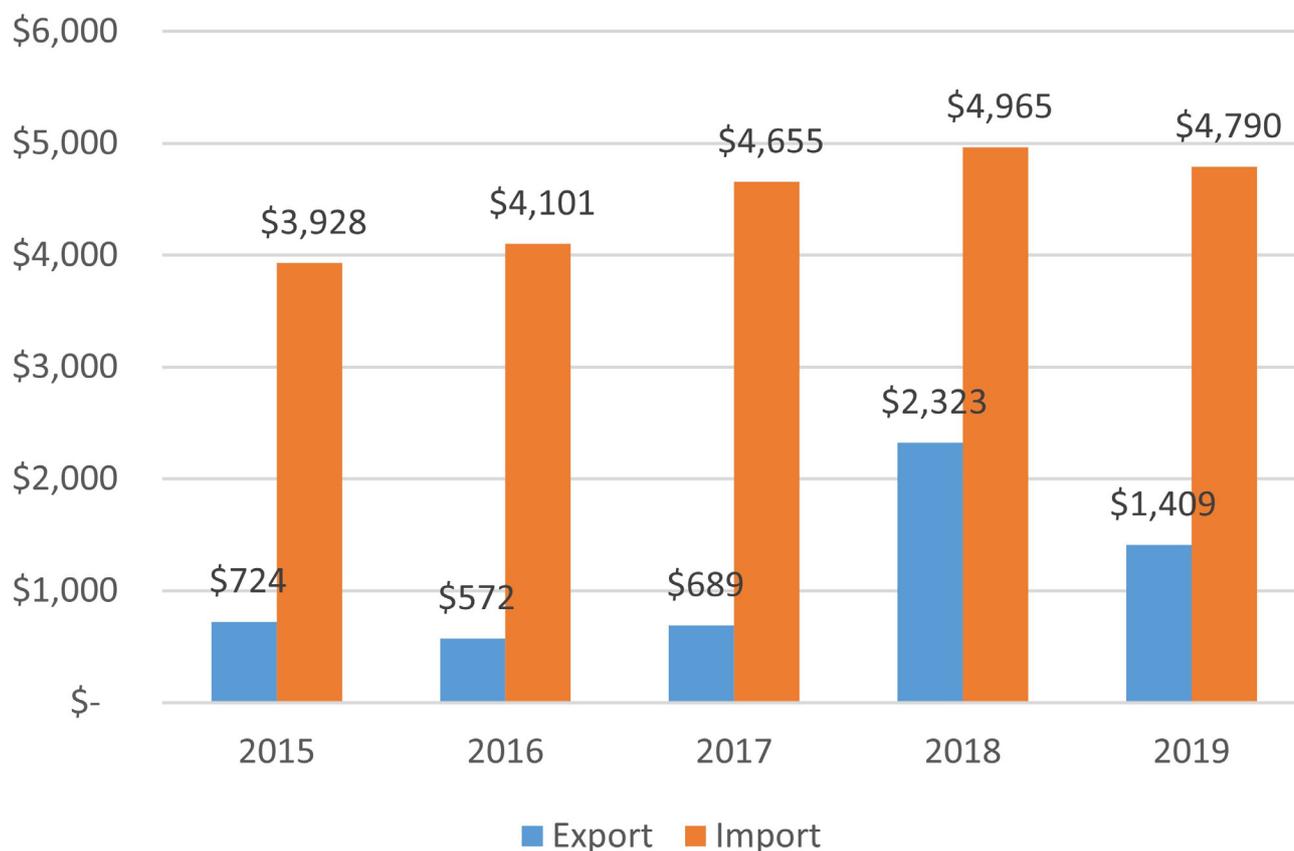


Figure 47 shows the comparison of imports and exports of Pakistan in agrotech category. It can be noted that imports remained almost constant during these years however, there is a dip in exports of about US\$1.0 million from 2018 to 2019.

Figure 47: Pakistan's agrotech export and imports (thousand US\$) comparison (2015-19) ⁽²⁾



2.11.1.2 Buildtech

There are eight main HS codes in this category as given in table 17. Pakistan is a net exporter in this category. Pakistan's total imports in this category in 2019 were US\$2.968 million whereas exports were worth US\$72.819 million.

Pakistan's total imports in this category in 2019 were US\$2.968 million whereas exports were worth US\$72.819 million.

Table 17. HS codes of main products included in buildtech category

HS code	Product description
680610	Slag wool, rock wool and similar mineral wools (including intermixtures thereof), in bulk, sheets or rolls
5905	Textile wall coverings
5904	Linoleum, whether or not cut to shape; floor coverings consisting of a coating or covering applied on a textile backing, whether or not cut to shape
630612	Tarpaulins, awnings and sunblinds; of synthetic fibres
630619	Tarpaulins, awnings and sunblinds; of textile materials other than synthetic fibres
630622	Tents; of synthetic fibres
630629	Tents; of textile materials other than synthetic fibres
630630	Sails; for boats, sailboards or landcraft

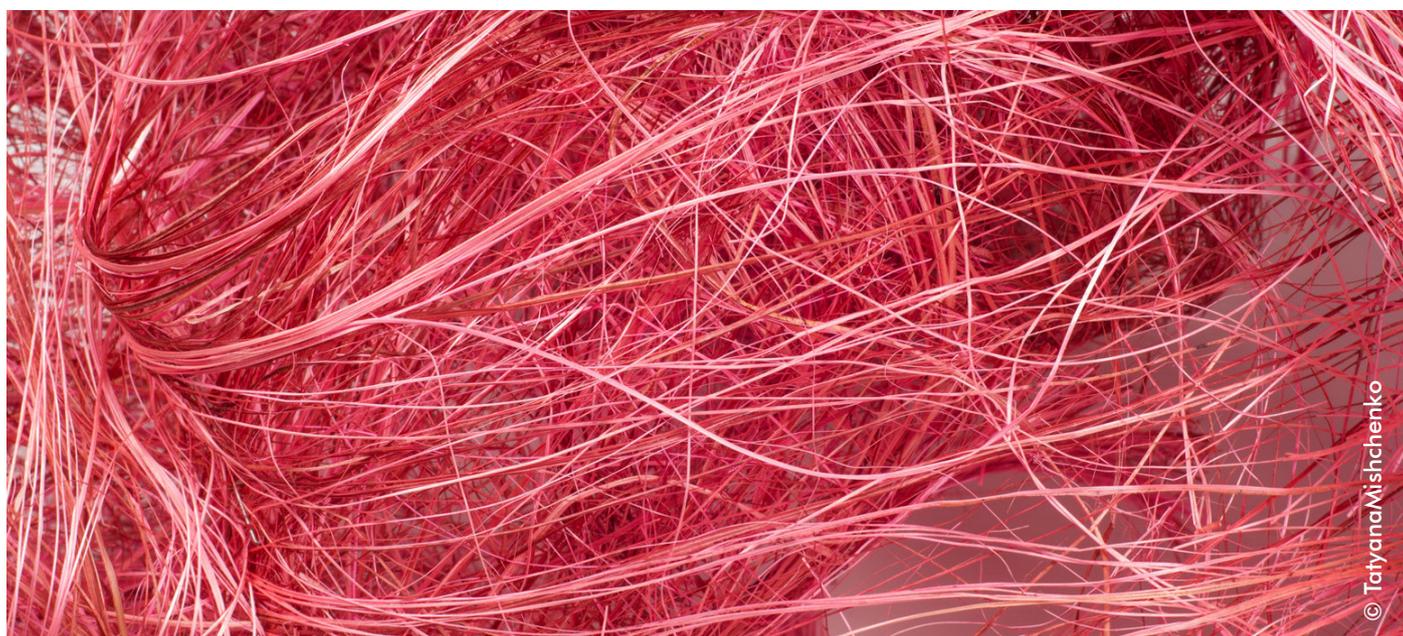
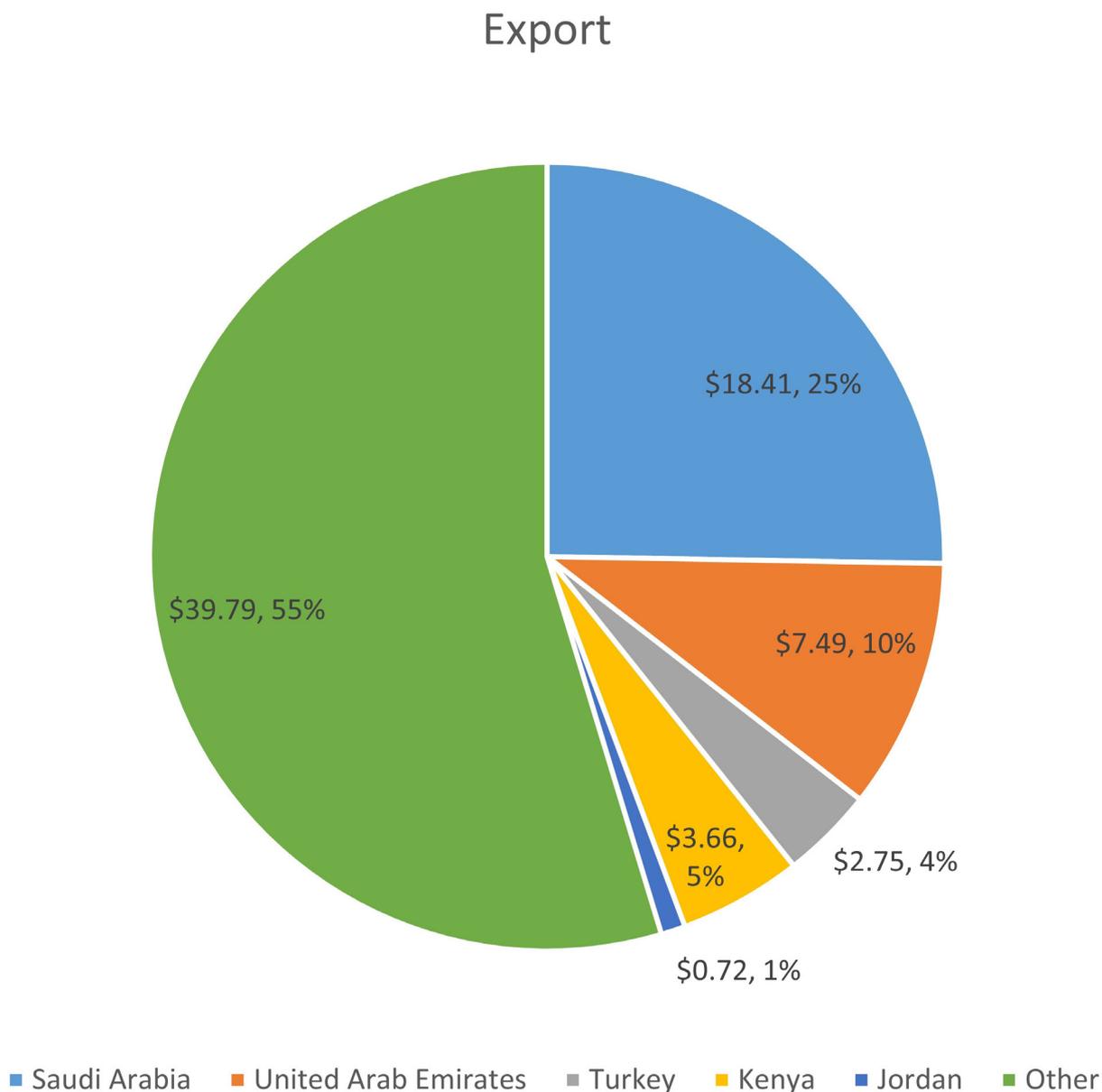


Figure 48: Pakistan's buildtech export (million US\$) to world ⁽²⁾

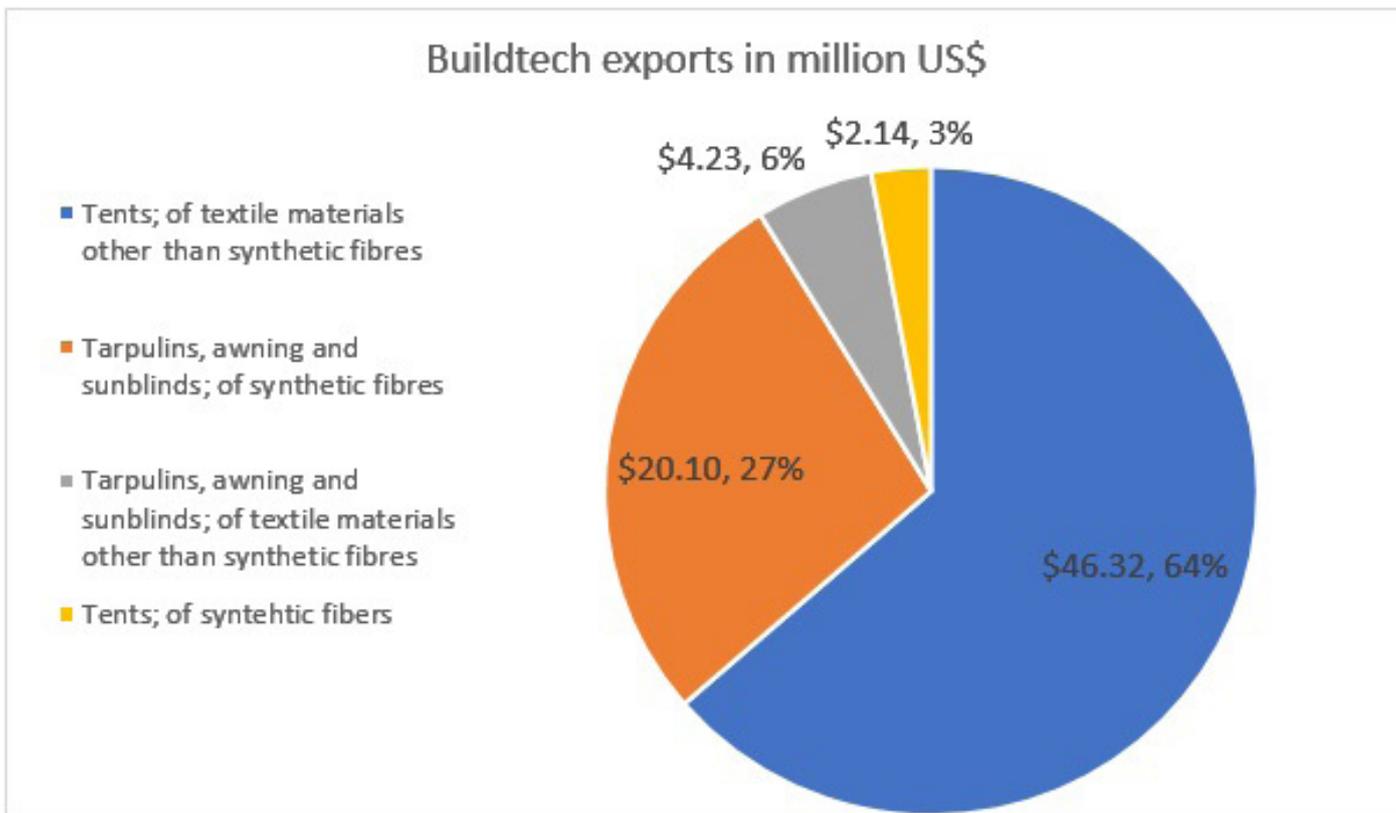


In buildtech, Pakistan's major export destinations are Saudi Arabia, UAE, Turkey, Kenya and Afghanistan as shown in figure 48.

Pakistan's major exports are tents, of natural fibers (64 per cent), tarpaulins of synthetic fibers (27 per cent) and tarpaulins of natural fibers (6 per cent) in the buildtech category as shown in figure 49.

In this category, Pakistan's imports are mainly from China, France, Malaysia, Republic of Korea etc. The main imported products are tents made of textile materials other than synthetic fibres (48 per cent), slag wool, rock wool and similar mineral wools (including intermixtures thereof), in bulk, sheets or rolls (35 per cent) and Tarpaulins of synthetic fibers (13 per cent).

Figure 49: Pakistan's buildtech exports (million US\$) to world, product wise breakdown ⁽²⁾



In buildtech, Pakistan's imports are decreasing from US\$6.0 million in 2017 to US\$3.0 million in 2019 as shown in figure 50. Exports were at an all-time high in 2017 with a value of US\$113 million, however, they decreased to US\$73 million in 2019.

Figure 50: Pakistan's buildtech exports and imports (thousand US\$) comparison (2015-19) ⁽²⁾



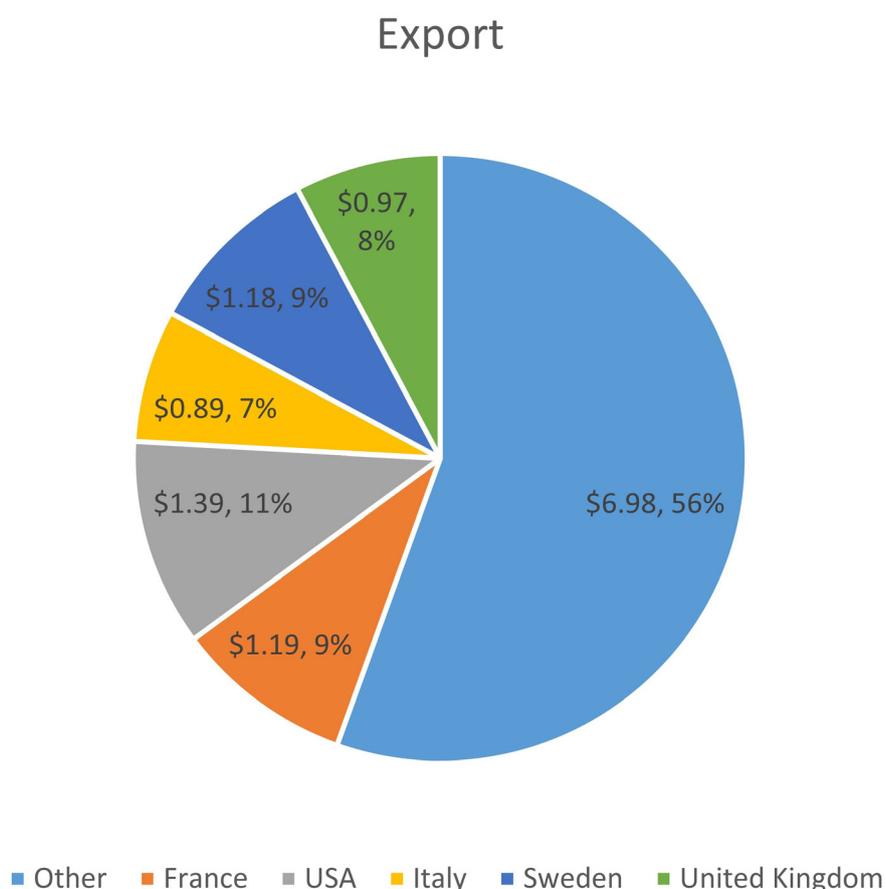
2.11.1.3 Clothtech

There are mainly three HS codes in this category as shown in table 18. The total trade volume in the world in this category was US\$7.9 billion in 2019. Pakistan imported goods worth US\$45 million in this category in 2019 whereas the exports were only US\$12.5 million which is 3.7 times less than the imports. The exports were only 0.16 per cent of the total trade volume which is very little.

Table 18. HS Codes of main products included in clothtech category

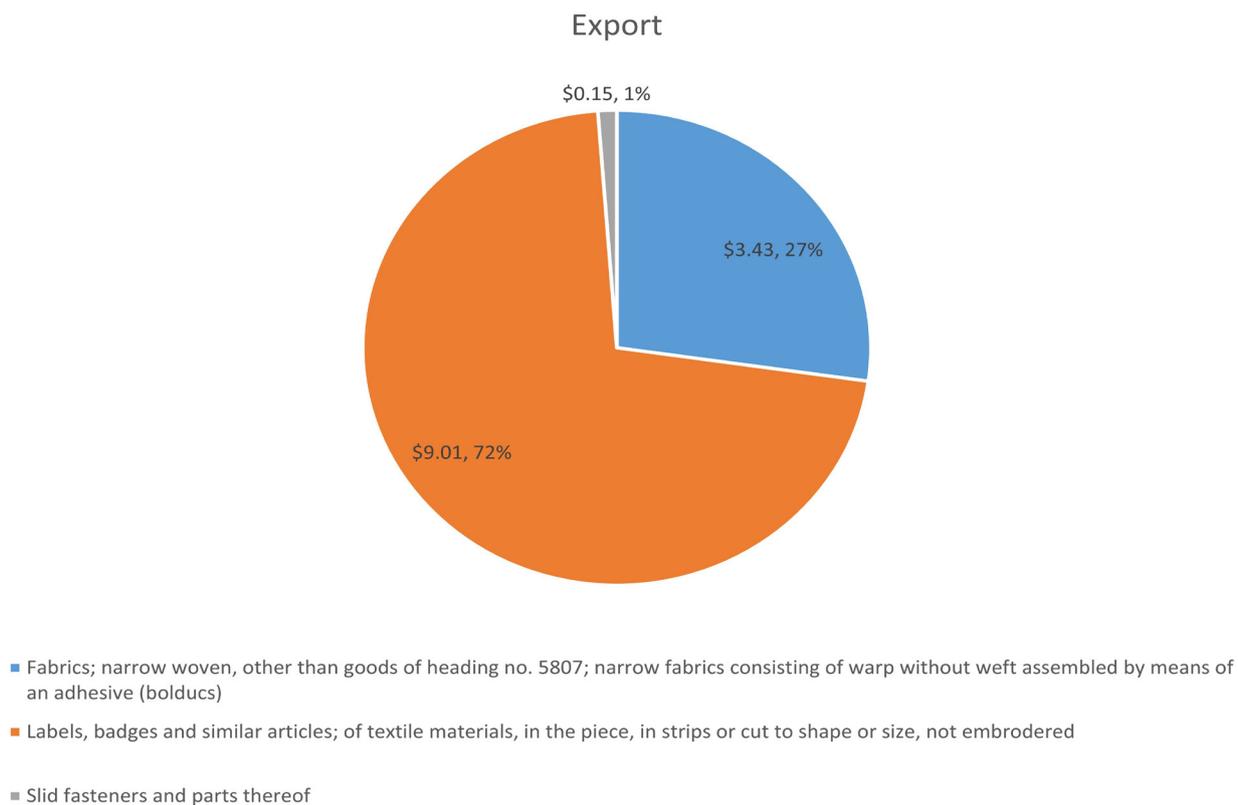
HS code	Product description
5807	Labels, badges and similar articles; of textile materials, in the piece, in strips or cut to shape or size, not embroidered
9607	Slide fasteners and parts thereof
5806	Fabrics; narrow woven, other than goods of heading no. 5807; narrow fabrics consisting of warp without weft assembled by means of an adhesive (bolducs)

Figure 51: Pakistan's clothtech export (million US\$) to world, country wise breakdown ⁽²⁾



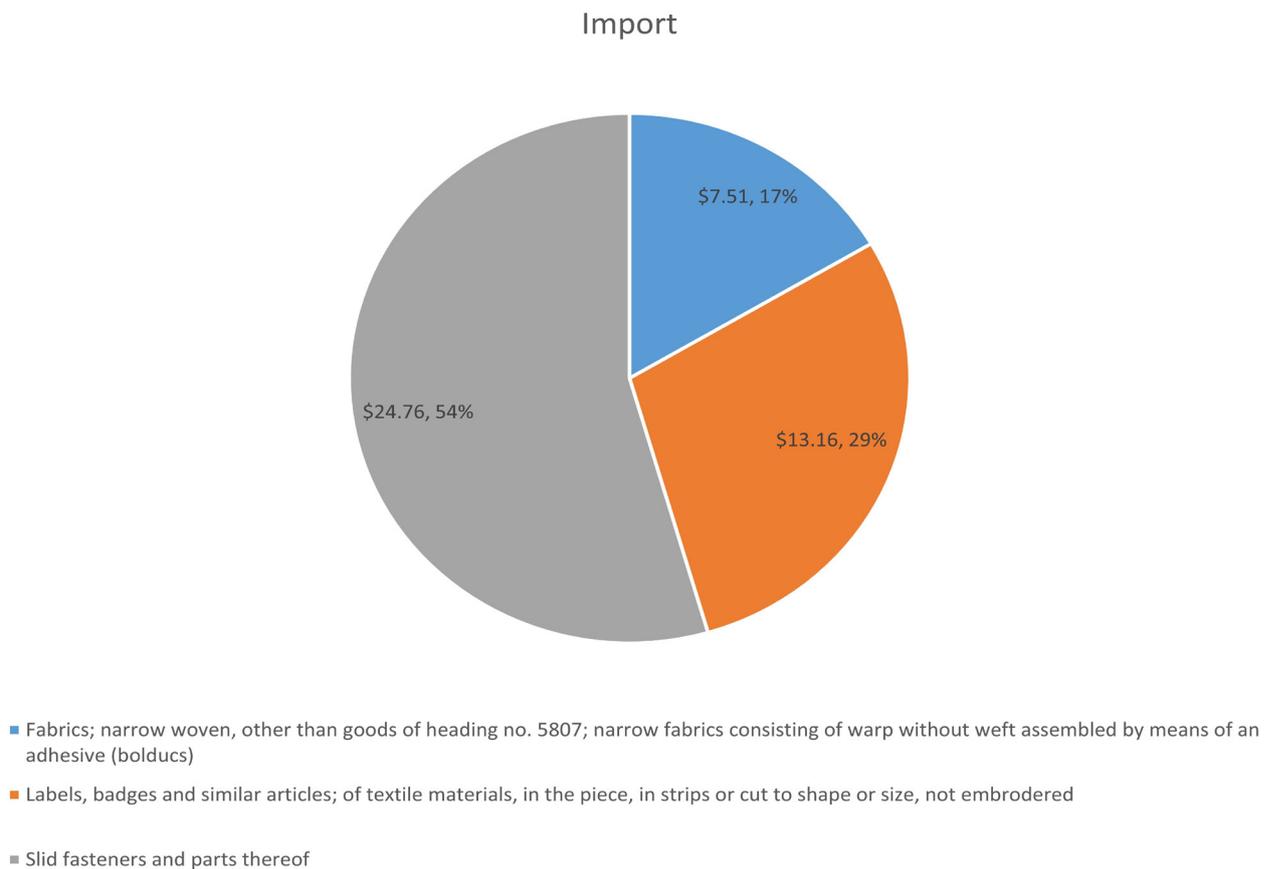
The major export destinations of Pakistan in this category include USA (11 per cent), United Kingdom (8 per cent), Sweden (9 per cent) and France (9 per cent) as shown in figure 51.

Figure 52: Pakistan's clothtech export (million US\$) to world, product wise breakdown ⁽²⁾



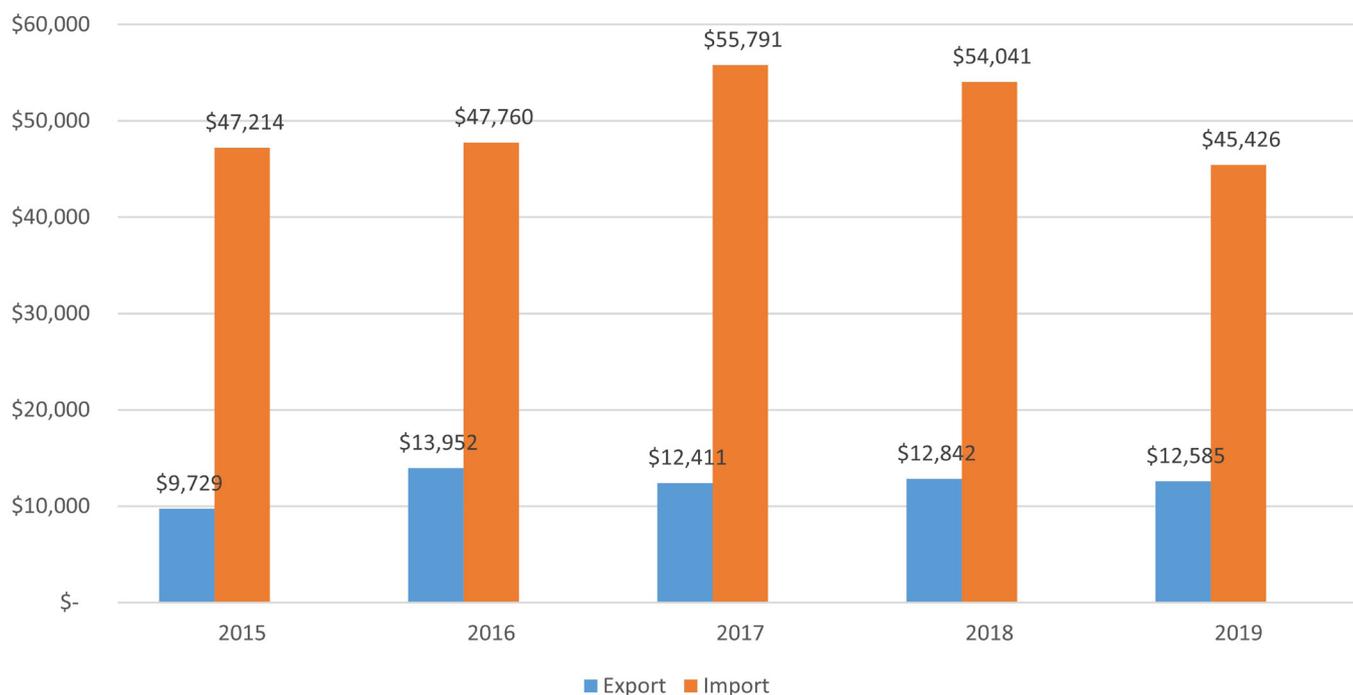
Looking at the exports of this category, the products include textile labels (72 per cent) and narrow fabrics (27 per cent) as shown in figure 52. The main imports in this category are from China (72 per cent), Indonesia (6 per cent) and India (4 per cent).

Figure 53: Pakistan's clothtech import (million US\$) from world, product wise breakdown ⁽²⁾



Slide fasteners are the major products (54 per cent) that Pakistan imports followed by labels (29 per cent) and narrow fabrics (17 per cent) as shown in figure 53.

Figure 54: Pakistan's clothtech exports and imports (thousand US\$) comparison (2015-19) ⁽²⁾



Pakistan is a net importer in this category as shown in figure 54. Clothtech exports of Pakistan remained almost the same over the last five years with a value of US\$12.585 million in 2019. Pakistan's imports also remained the same in the given period with a value of US\$45.426 million in 2019.

US\$12.585 million

Clothtech exports of Pakistan remained almost the same over the last five years

2.11.1.4 Hometech

This category has a major HS code 940429, that is "Mattresses, of other materials, not cellular rubber or plastics ". It has a trade volume of US\$2.6 billion. Pakistan exports only US\$22,000 whereas it imports US\$203,000 mainly from Republic of Korea and China.

2.11.1.5 Mobiltech

This category has eight HS codes as shown in Table 19. It has a trade volume of US\$27.79 billion. Pakistan's exports are US\$1.2 million, whereas its imports are US\$29.3 million in 2019.

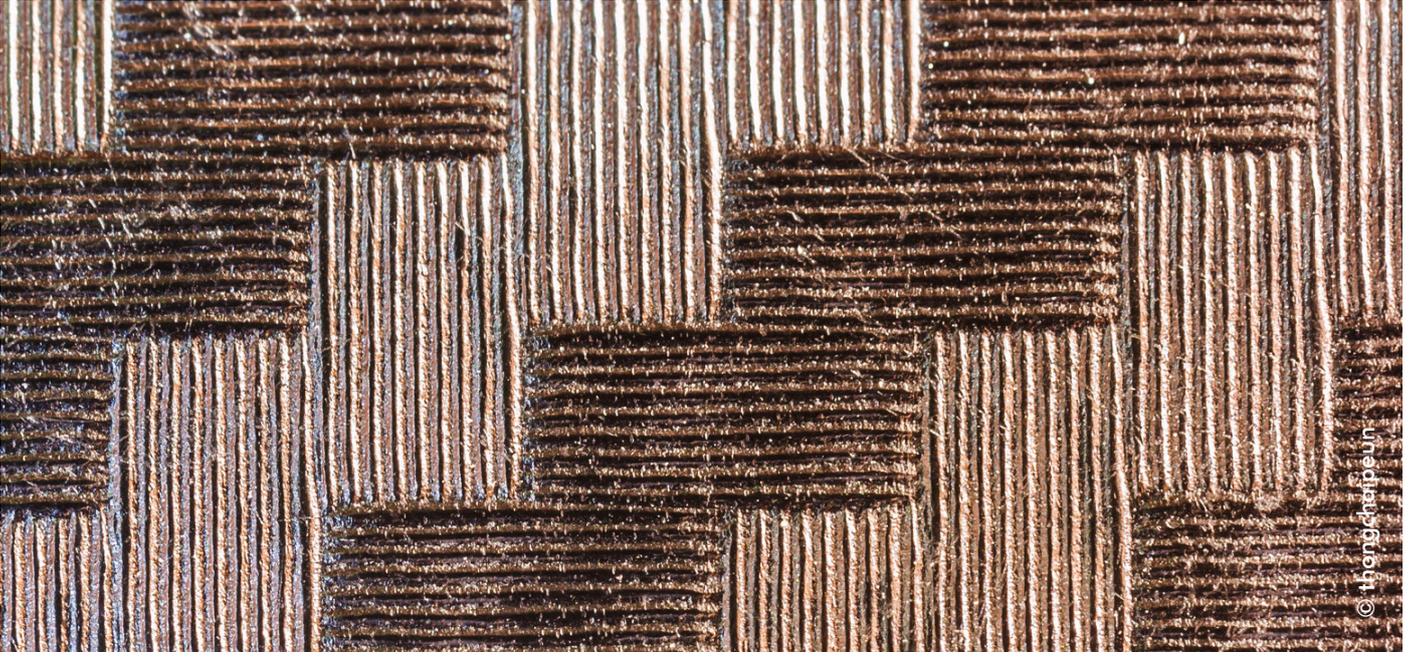
Table 19. HS Codes of main products included in mobiltech category

HS code	Product description
5703	Carpets and other textile floor coverings; tufted, whether or not made up
590210	Textile fabrics; tyreCORD of high tenacity yarn of nylon or other polyamides
590290	Textile fabrics; tyreCORD of high tenacity yarn of viscose rayon
870821	Vehicles; parts of bodies, safety seat belts
590220	Textile fabrics; tyreCORD of high tenacity yarn of polyester
940110	Seats; of a kind used for aircrafts
940120	Seats; of a kind used for motor vehicles
870895	Vehicle parts; safety airbags with inflater system; parts thereof

Pakistan's major export destinations in this category are Japan (23 per cent), France (34 per cent) and Qatar (13 per cent) where the major export products in this category are carpets and floor covering (53 per cent) and tyreCORD textile fabrics (46 per cent).

Main export destinations are Japan, France and Qatar.

**Major export products include
carpets, floor covering and tyreCORD textile fabrics.**



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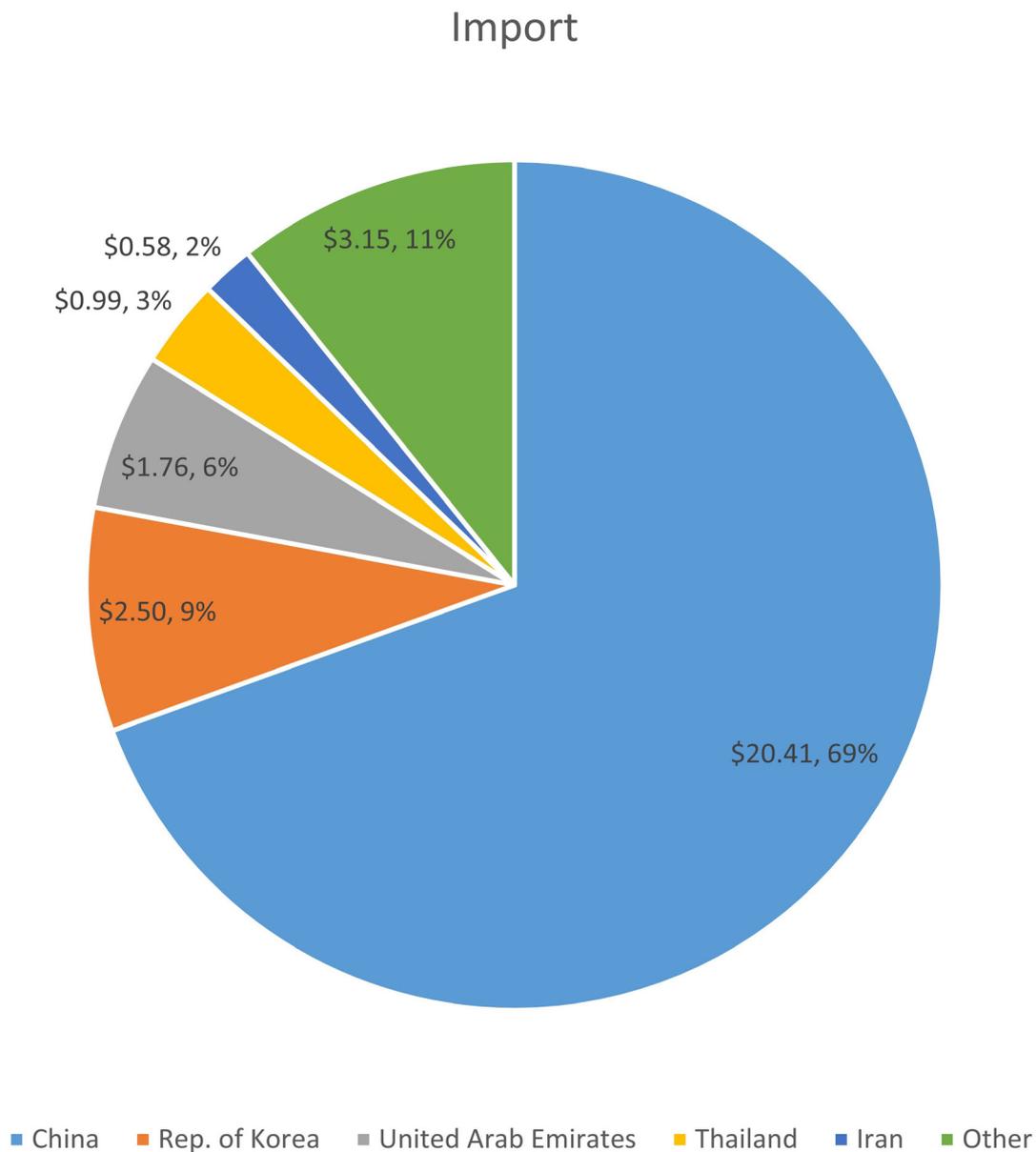


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Figure 55: Countries from which Pakistan is importing mobiltech (million US\$) ⁽²⁾

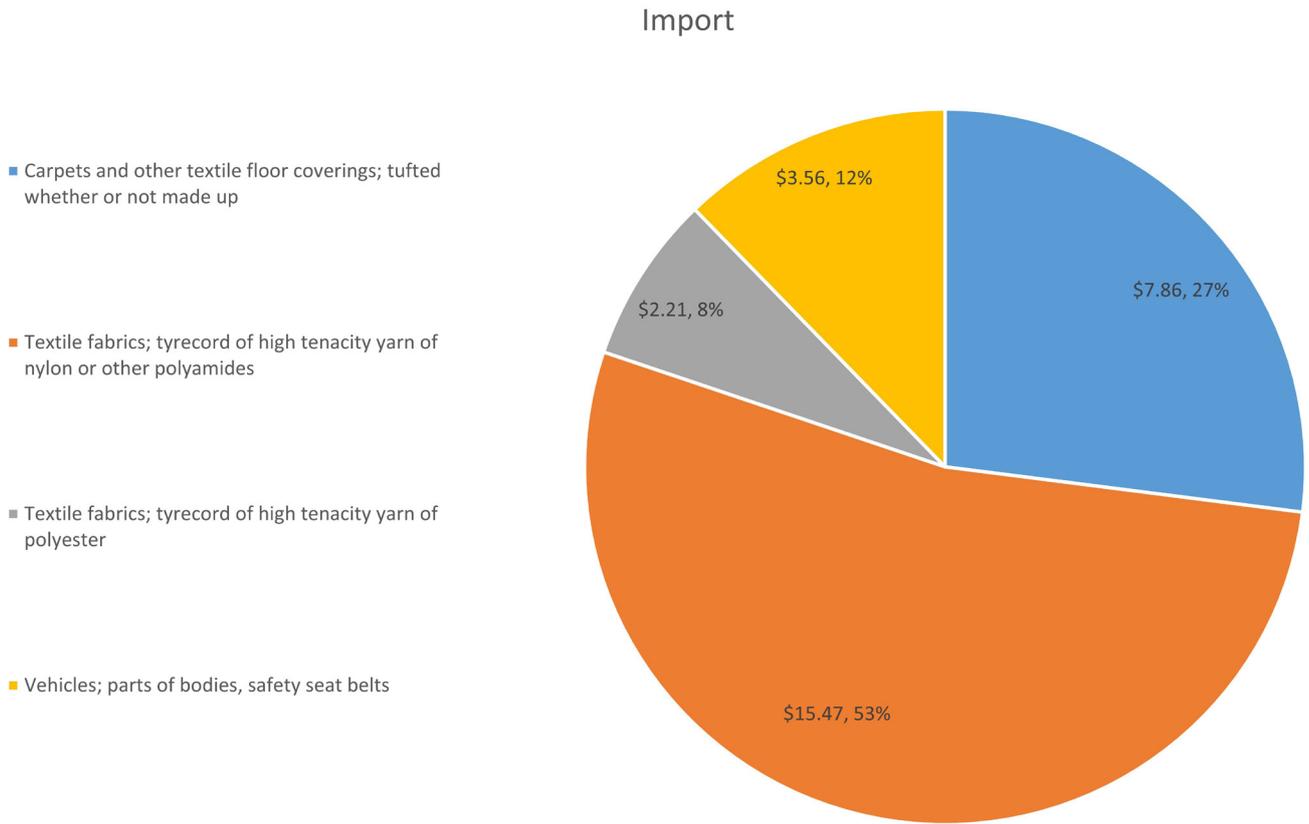


Pakistan’s major import partners in this category are China (69 per cent), Korea (9 per cent) and UAE (6 per cent) as shown in figure 55.

Pakistan’s major import products in this category are carpets and floor covering (27 per cent) and tyre cord textile fabrics (53 per cent) and safety belts (12 per cent) as shown in figure 56.

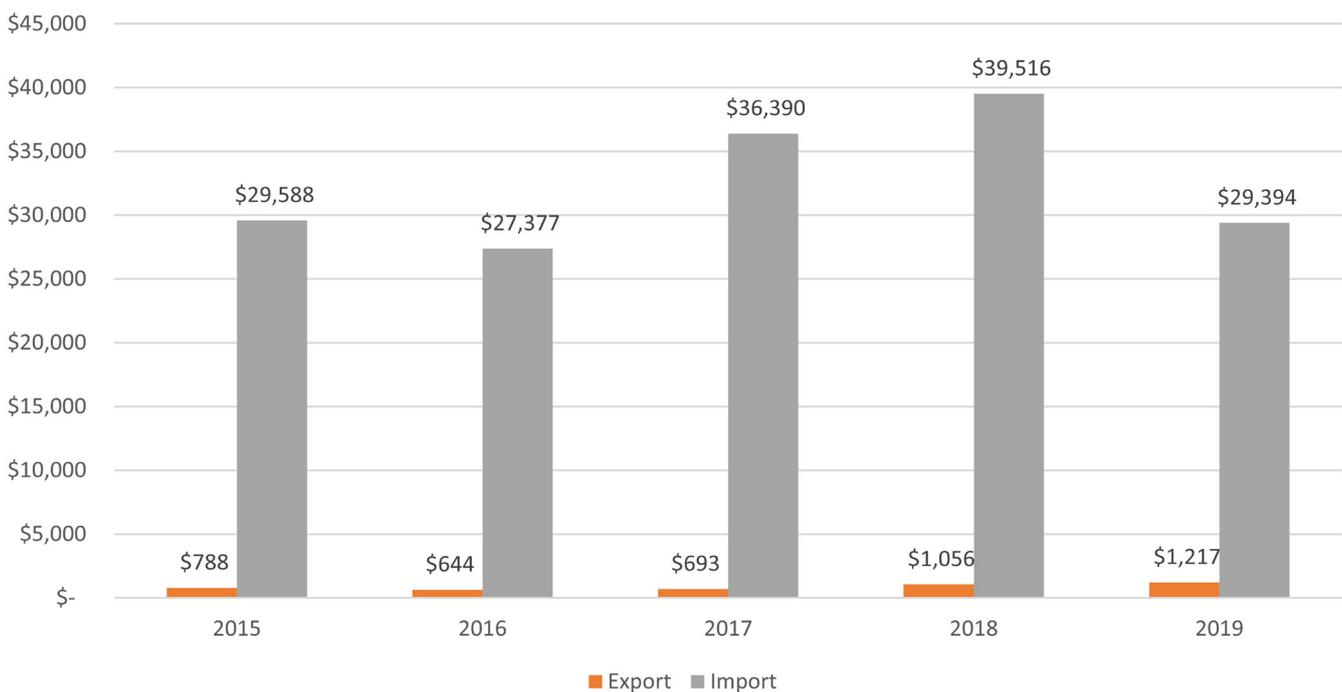
Pakistan’s major import products include carpets, floor covering, tyre cord textile fabrics and safety belts.

Figure 56: Pakistan's mobiltech import (million US\$) from world, product wise breakdown ⁽²⁾



Pakistan's major import products in this category are carpets and floor covering (27 per cent) and tyreCORD textile fabrics (53 per cent), safety belts (12 per cent) as shown in figure 56.

Figure 57: Pakistan's mobiltech export and import (thousand US\$) comparison (2015-19) ⁽²⁾



Pakistan is a net importer in this category as shown in figure 57. Clothtech export of Pakistan remained almost same over the last five years with a value of US\$1.2 million in 2019. Pakistan’s imports continued to increase till 2017, however, witnessed a decrease in 2019 as the figure plummeted to US\$29.39 million in 2019.

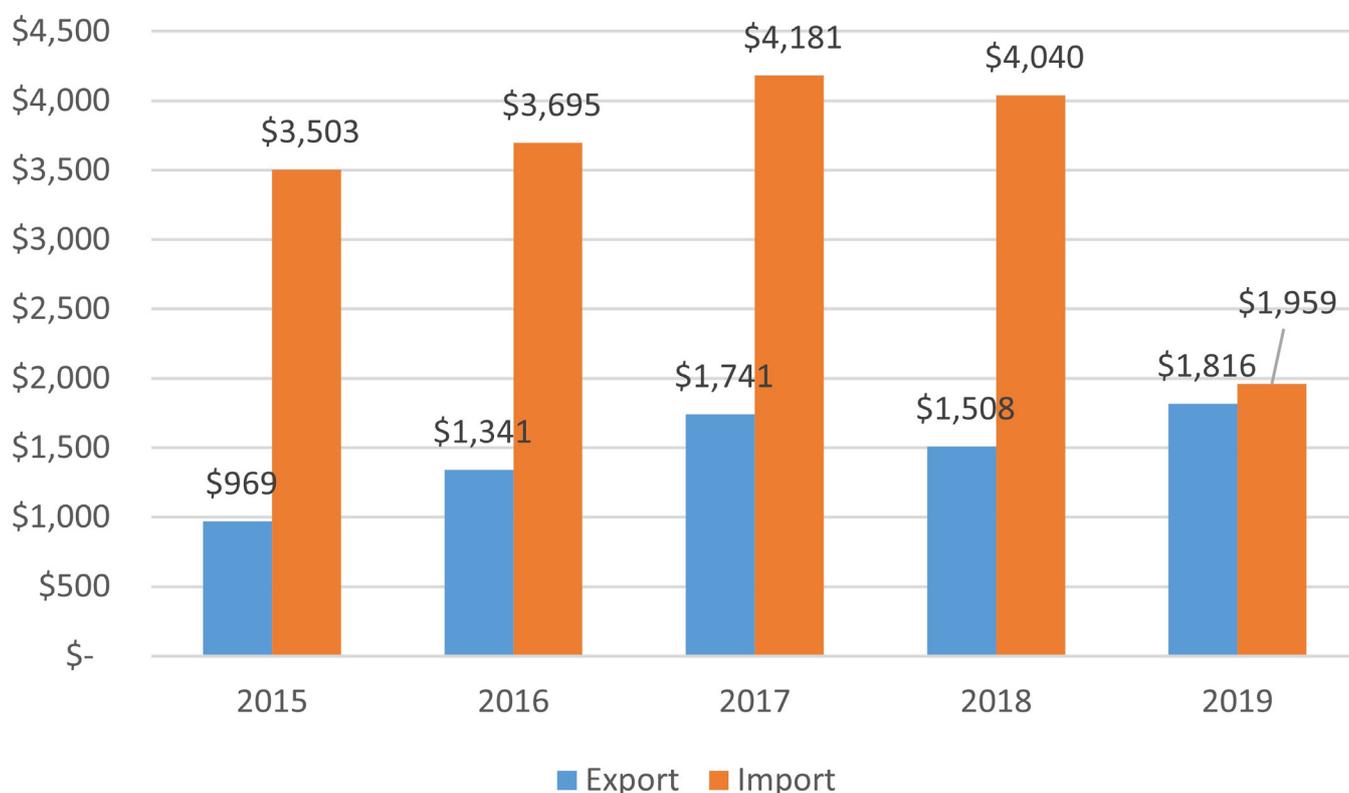
2.11.1.6 Oekotech

The global trade volume in this category is US\$2.8 billion. Pakistan’s exports in 2019 remained US\$1.8 million which is 0.06 per cent of the total global exports. In 2019, Pakistan imported textile products worth US\$1.9 million as shown in table 20 and figure 58.

Table 20. HS codes of main products included in oekotech category

HS code	Product description
591190	Textile products and articles for technical uses; n.e.c. in heading no. 5911

Figure 58: Pakistan’s oekotech export and import (thousand US\$) comparison (2015-19) ⁽²⁾



2.11.1.7 Packtech

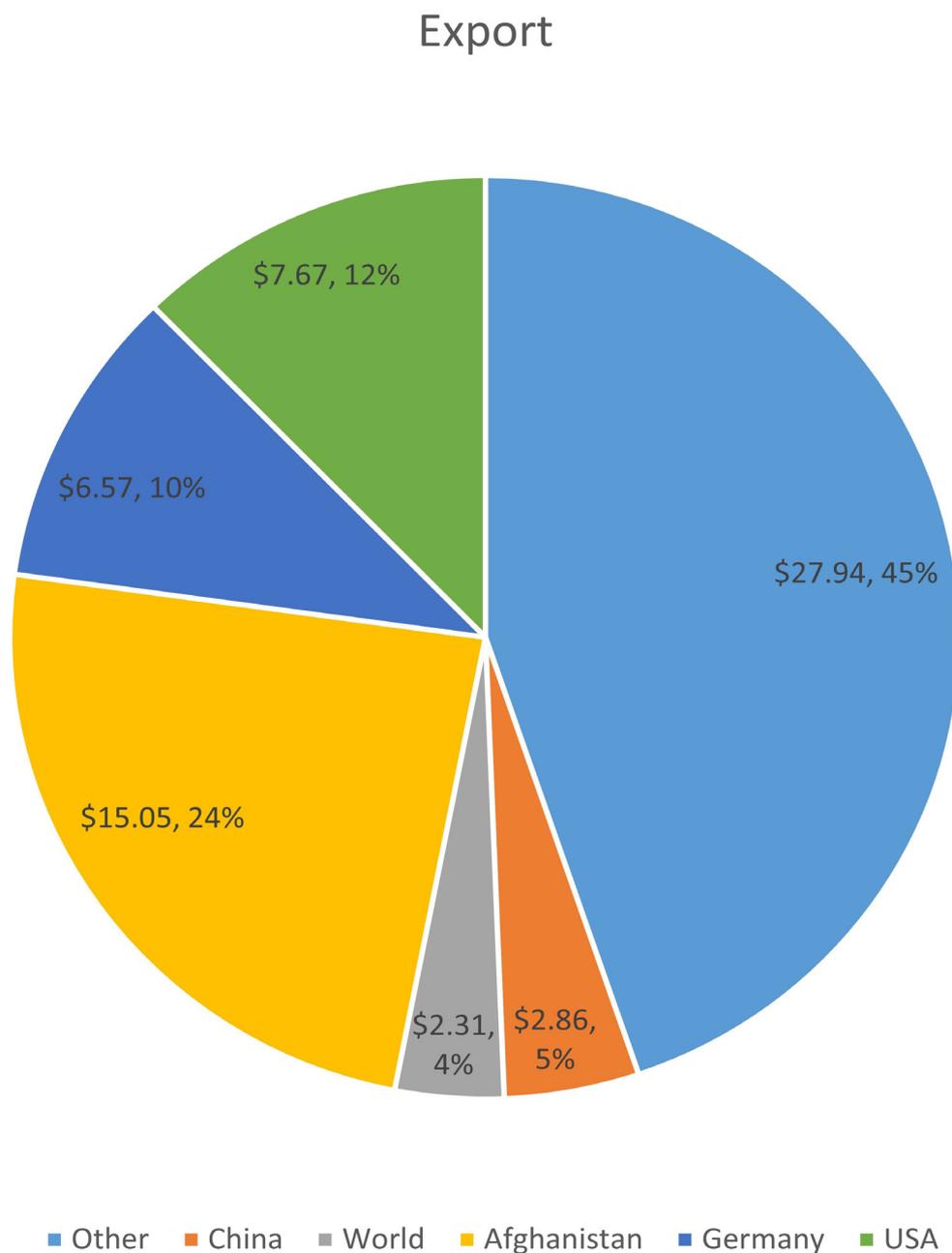
Six HS codes (table 21) were considered in this category when determining trade volume. The total trade volume in this category is equal to US\$42.7 billion. Pakistan's exports amount to a total of US\$62 million, which is 0.15 per cent of global exports. At the same time, Pakistan imports goods worth US\$16.8 million in this category as well.

Table 21. HS codes of main products included in packtech category

HS Code	Product description
420212	Cases and containers; trunks, suit-cases, vanity-cases, executive-cases, brief-cases, school satchels and similar containers, with outer surface of plastics or of textile materials
420222	Cases and containers; handbags (whether or not with shoulder strap and including those without handle), with outer surface of sheeting of plastics or of textile materials
420292	Cases and containers; n.e.c. in heading 4202, with outer surface of plastic sheeting or of textile materials
420292	Cases and containers; n.e.c. in heading 4202, with outer surface of sheeting of plastics or of textile materials
420222	Cases and containers; handbags (whether or not with shoulder strap and including those without handle), with outer surface of plastic sheeting or of textile materials
6305	Sacks and bags, of a kind used for the packing of goods



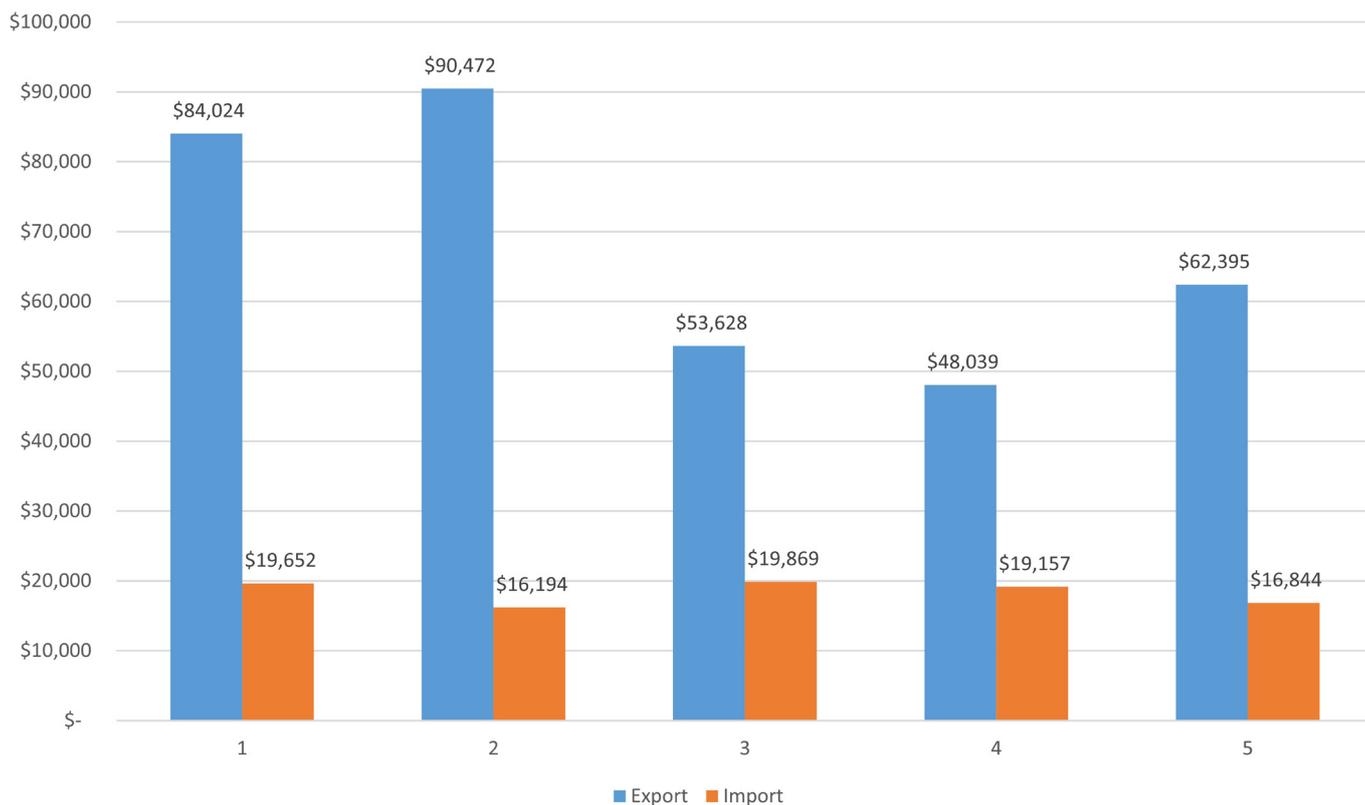
Figure 59: Pakistan's packtech export (million US\$) to world, country wise breakdown ⁽²⁾



Pakistan's major export destinations in this category include Afghanistan (24 per cent), USA (12 per cent), Germany (10 per cent), and China (5 per cent) as shown in figure 59. Pakistan's major export products in this category include sacks and bags of textiles (94 per cent).

Pakistan's major import partners in this category include China (81 per cent), Thailand (6 per cent) and India (3 per cent). Pakistan's major import products in this category include cases and containers; trunks, suit-cases, vanity-cases, executive-cases etc. (51 per cent), cases and containers with outer surface of plastics etc. (30 per cent) and cases and containers; handbags etc. (14 per cent).

Figure 60: Pakistan's Packtech exports and imports (thousand US\$) comparison (2015-19) ⁽²⁾



Pakistan is a net exporter in this category that are not particularly stable as shown in figure 60. It achieves a maximum value US\$90.472 million in 2017 however, this value becomes US\$62.395 million in 2019. Pakistan's imports are decreasing and were equal to US\$16.844 million in 2019.

Pakistan's imports are decreasing and were equal to US\$16.844 million in 2019.

2.11.1.8 Indutech

The total global trade volume in this category was US\$5.8 billion. Pakistan's exports were US\$0.227 million in 2019 while imports remained US\$16.6 million. While analyzing trade, 5 HS codes given in table 22 were considered.

US\$0.227 million

Pakistan's Indutech export in 2019

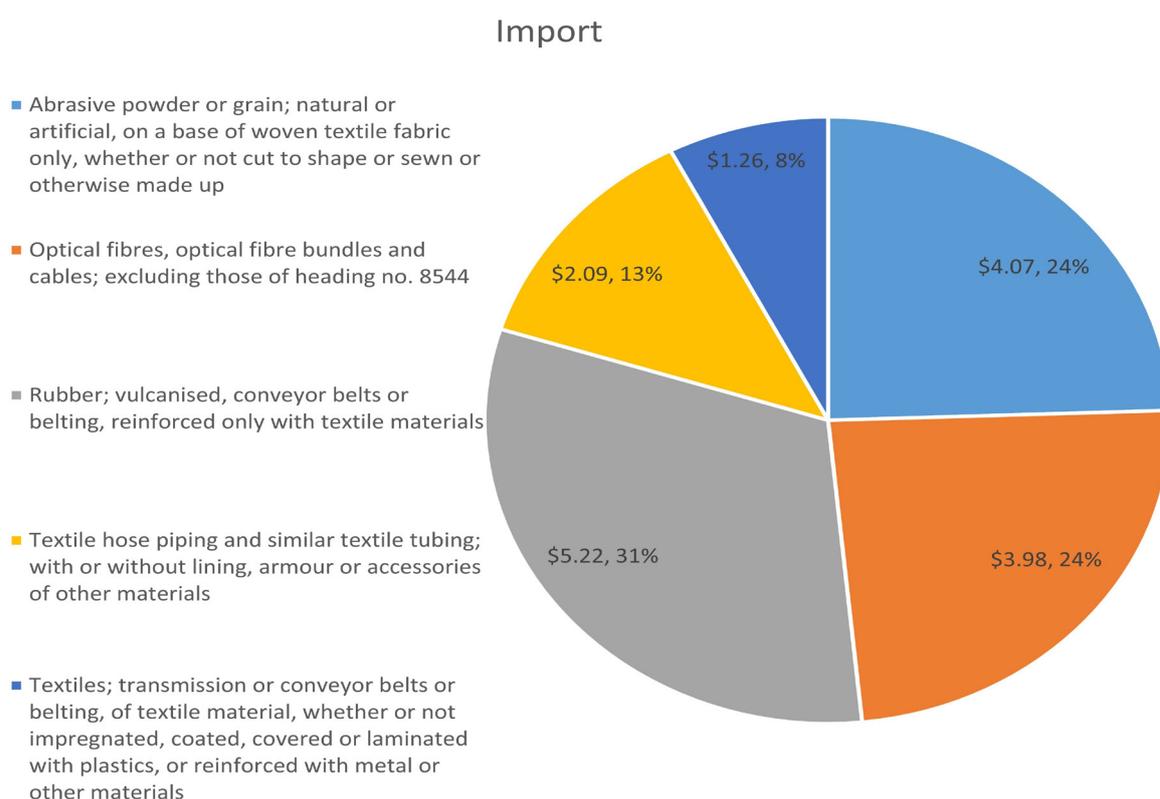
Table 22. HS codes of the main products included in the indutech category

HS code	Product description
401012	Rubber; vulcanised, conveyor belts or belting, reinforced only with textile materials
680510	Abrasive powder or grain; natural or artificial, on a base of woven textile fabric only, whether or not cut to shape or sewn or otherwise made up
5910	Textiles; transmission or conveyor belts or belting, of textile material, whether or not impregnated, coated, covered or laminated with plastics, or reinforced with metal or other material
5909	Textile hose piping and similar textile tubing; with or without lining, armour or accessories of other materials
900110	Optical fibres, optical fibre bundles and cables; excluding those of heading no. 8544

Pakistan's major export in this category is to Oman (49 per cent), USA (11 per cent) and Afghanistan (8 per cent). There are two products i.e. rubber conveyor belts (61 per cent) and textile conveyor belts (38 per cent) that cover 99 per cent of Pakistan's exports in this category. Pakistan's major import in this category is from China (36 per cent), USA (15 per cent), Korea (14 per cent) and Italy (10 per cent).

Regarding imports, abrasive powder on a base of woven fabric (24 per cent), optical fibers (24 per cent), rubber conveyor belts (31 per cent), textile hose (13 per cent) and textile conveyor belts (8 per cent) are the major imported products as shown in figure 61.

Figure 61: Pakistan's indutech import (million US\$) from the world, product wise breakdown ⁽²⁾



Pakistan is a net importer in this category.

2.11.1.9 Medtech

The total global trade volume in this category is US\$42.9 billion. This is calculated taking into account five HS codes given in table 23. Pakistan's exports remained US\$89 million in 2019, which is 0.21 per cent of the total global exports in this category. In 2019, Pakistan's imports in this category remained US\$68 million.

Table 23. HS codes of main products included in medtech category

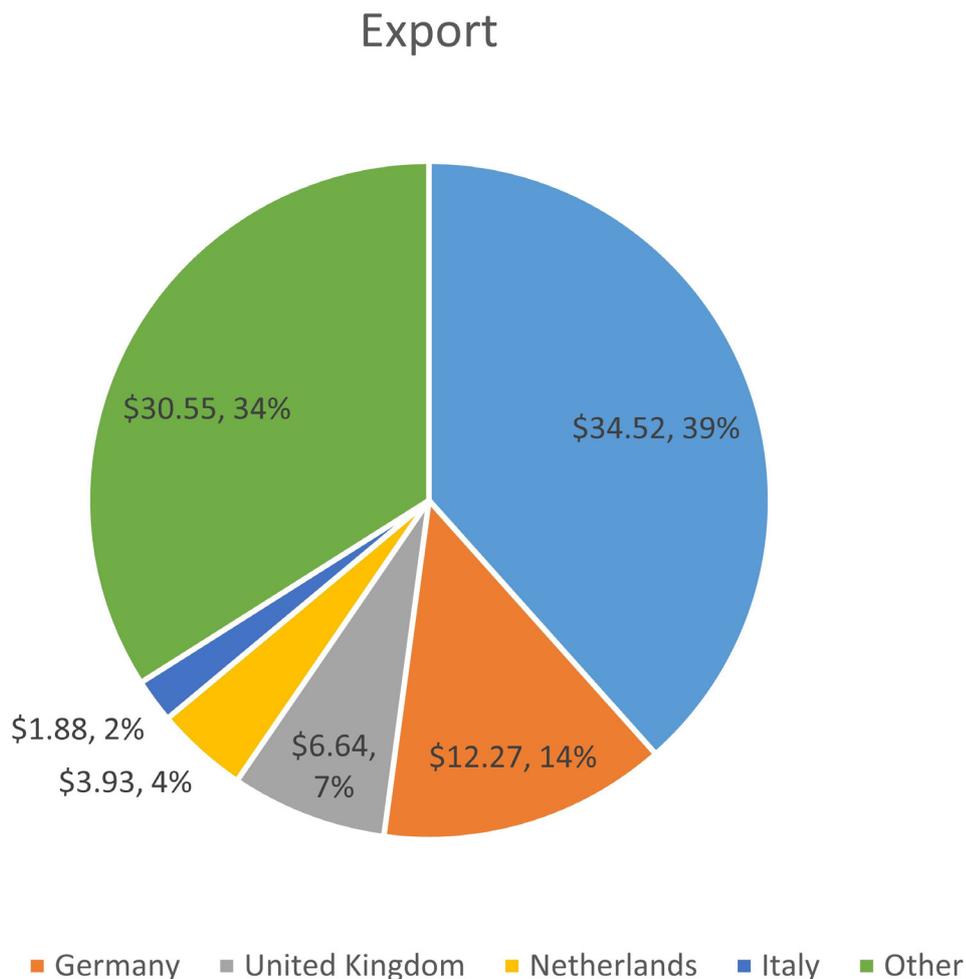
HS code	Product description
3005	Wadding, gauze, bandages (dressings, adhesive plasters, poultices), impregnated or coated with pharmaceutical substances or in forms or packing for retail sale, for medical, surgical or veterinary use
9619	Sanitary towels (pads) and tampons, napkins and napkin liners for babies and similar articles, of any material
300610	Pharmaceutical goods; sterile surgical catgut, suture materials, tissue adhesives, laminaria, laminaria tents, absorbable surgical or dental haemostatics, and surgical or dental adhesion barriers
611510	Graduated compression hosiery (for example, stockings for varicose veins), knitted or crocheted
630790	Textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c. in heading no. 6307

Pakistan's major export in this category is to USA (39 per cent), Germany (14 per cent) and UK (4 per cent) as shown in figure 62.

The total global trade volume
in Medtech is US\$42.9 billion.



Figure 62: Pakistan's medtech export (million US\$) to the world, country wise breakdown ⁽²⁾



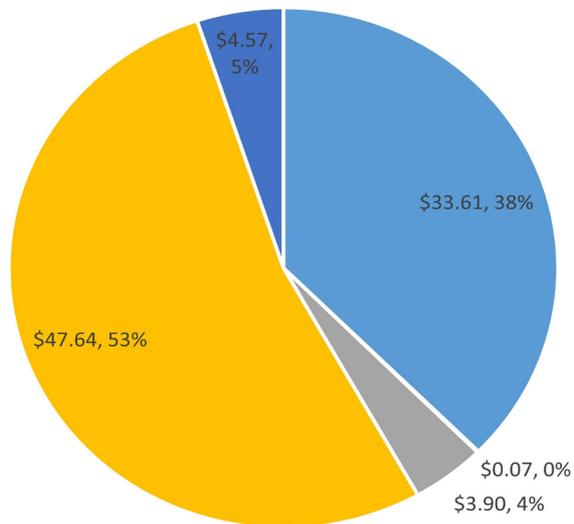
Exports include products such as textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c., in heading no. 6307 (53 per cent) and graduated compression hosiery (38 per cent), etc. as shown in figure 63.

Pakistan's imports in this category are mainly from China (35 per cent), Egypt (26 per cent) and Turkey (12 per cent) as shown in figure 64.

Figure 63: Pakistan's medtech exports (million US\$) to the world, product wise breakdown ⁽²⁾

Export

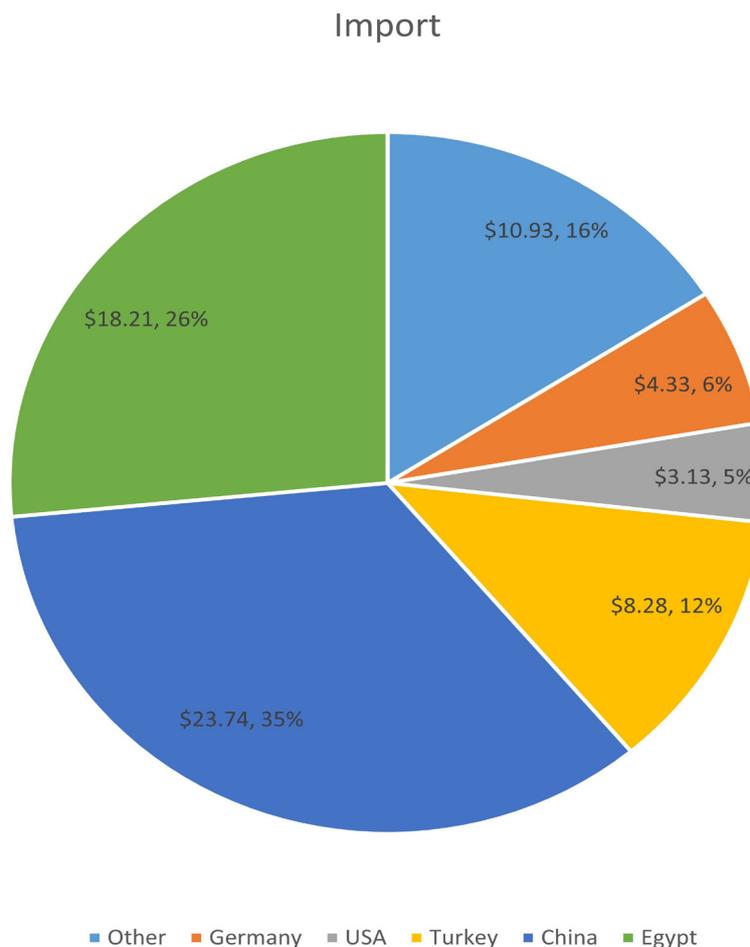
- Graduated compression hosiery (for example, stockings for varicose veins), knitted or crocheted
- Pharmaceutical goods; sterile surgical catgut, suture materials, tissue adhesives, laminaria, laminaria tents, absorbable surgical or dental haemostatics and surgical or dental adhesion barriers
- Sanitary towels (pads) and tampons, napkins and napkin liners for babies and similar articles of any material
- Textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c. in heading no. 6307
- Wadding, gauze, bandages (dressings, adhesive plasters, polutices), impregnated or coated with pharmaceutical substances or in forms or packings for retail sale, for medical, surgical or veterinary use



Pakistan's imports in this category are mainly from China (35 per cent), Egypt (26 per cent) and Turkey (12 per cent) as shown in figure 64.



Figure 64: Pakistan's medtech import (million US\$) from the world, country wise breakdown ⁽²⁾



Imports include products i.e. sanitary towels (pads) and tampons etc. (57 per cent), suture etc. (15 per cent), textile made up and graduated compression hosiery (4 per cent) etc. as shown in figure 65.

Figure 65: Pakistan's medtech import (million US\$) from the world, product wise breakdown

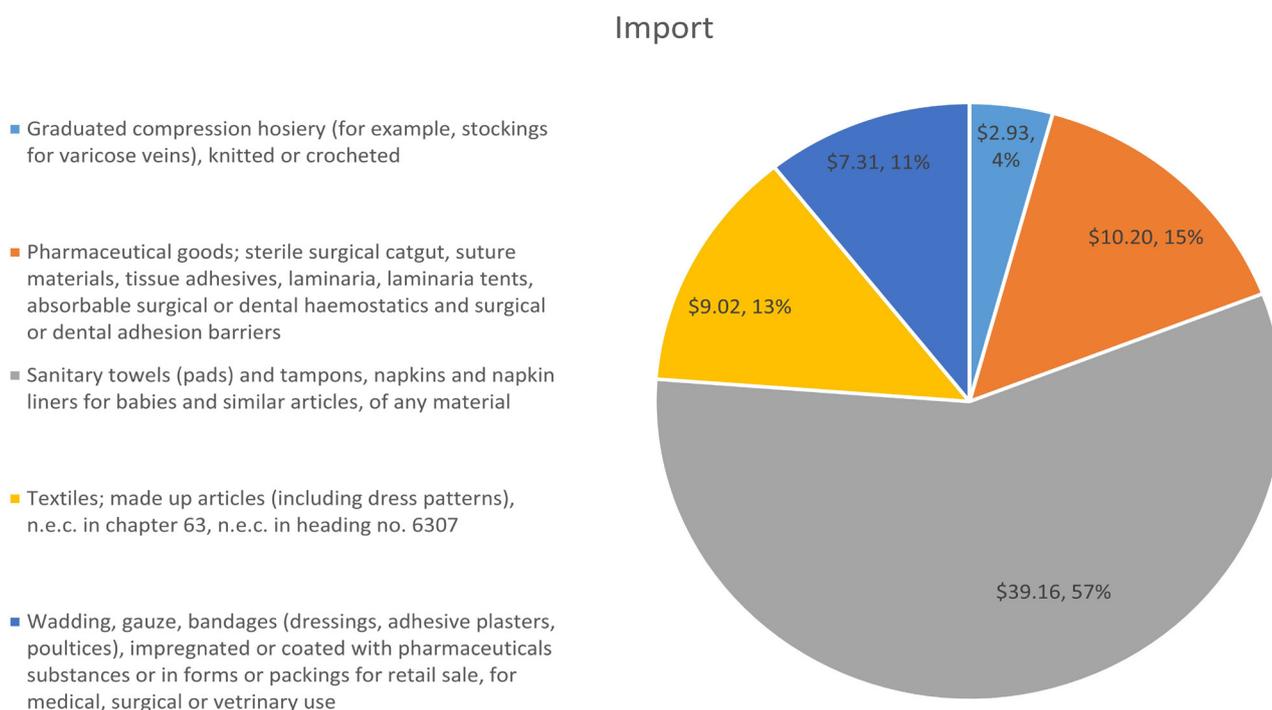
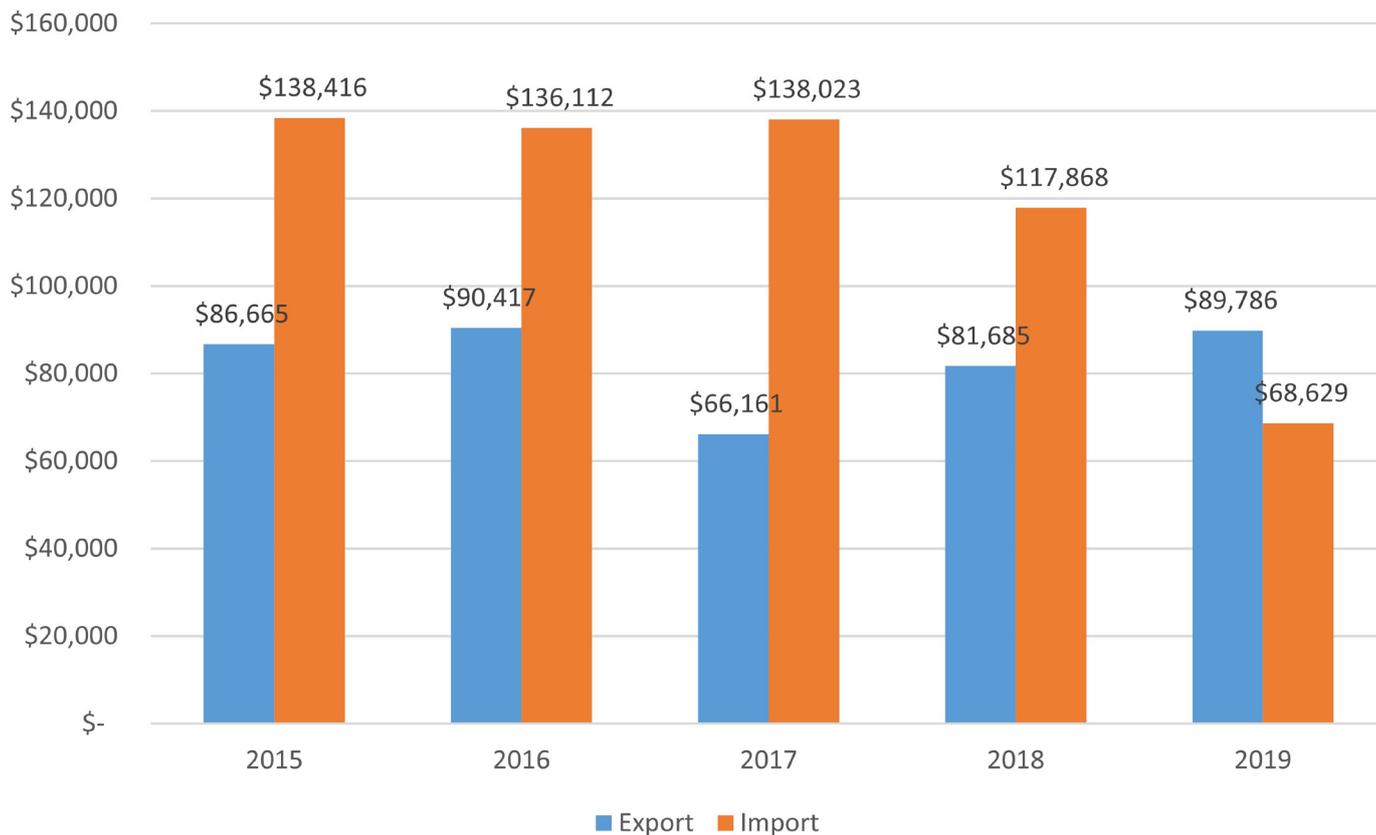


Figure 66: Pakistan’s medtech export and import (thousand US\$) comparison (2015-19) ⁽²⁾



As evident from figure 66, Pakistan was a net importer in this category until 2018, however, due to the increase in exports and subsequent decrease in imports in 2019, Pakistan became a net exporter in this category.

2.11.1.10 Protech

Considering the six HS codes given in table 24, the total global trade volume of this category is US\$22 billion. Pakistan exported worth US\$161 million in 2019, which is 0.7 per cent of the total trade. In 2019, Pakistan imported US\$3.3 million worth of protective textiles.

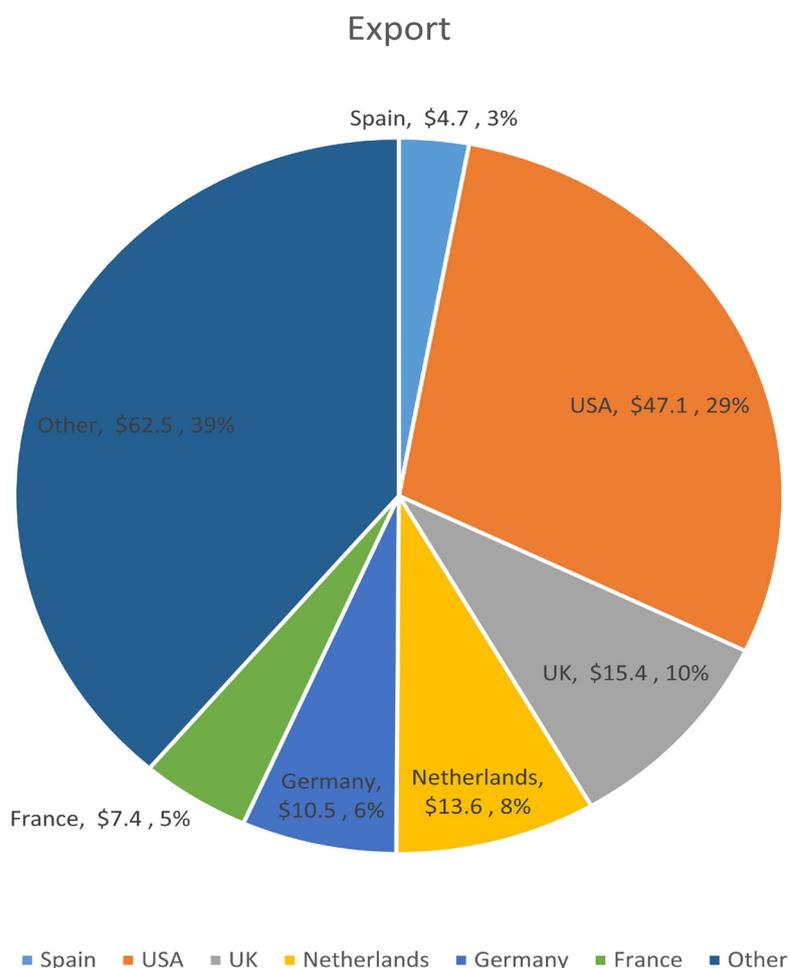
Pakistan exported worth US\$161 million in 2019, which is 0.7 per cent of the total trade.

Table 24. HS codes of the main products included in protech category

HS code	Product description
6114	Garments; knitted or crocheted, n.e.c. in chapter 61
611610	Gloves, mittens and mitts; knitted or crocheted, impregnated, coated or covered with plastics or rubber
6210	Garments made up of fabrics of heading no. 5602, 5603, 5903, 5906 or 5907 (not knitted or crocheted)
630720	Life-jackets and life-belts
6113	Garments made up of knitted or crocheted fabrics of heading no. 5903, 5906 and 5907
8804	Parachutes (including dirigible parachutes and paragliders) and rotochutes; parts thereof and accessories thereto

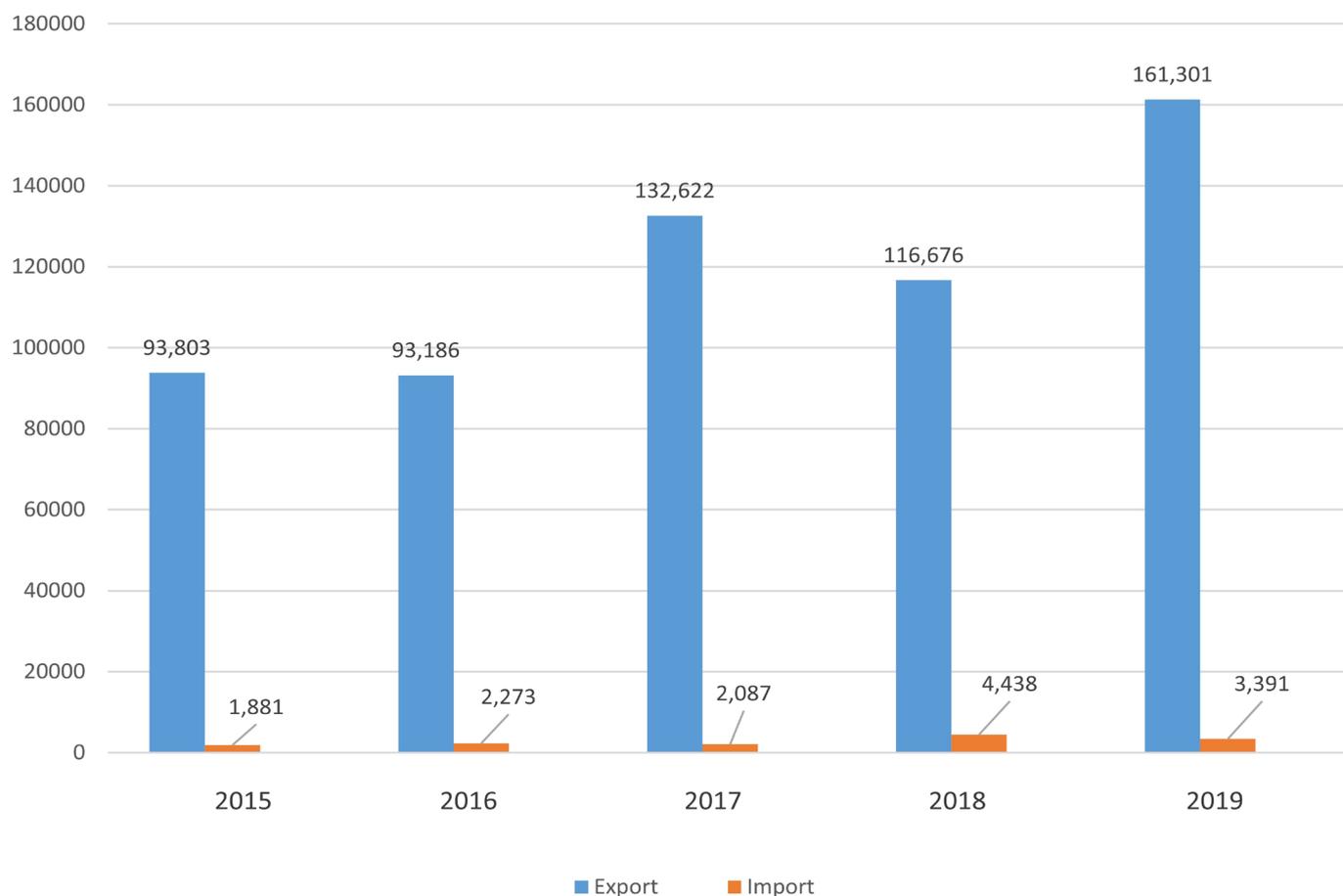
Pakistan’s major export in this category is to the USA (28 per cent), UK (9 per cent), Netherland (8 per cent) and Germany (8 per cent) etc. as shown in figure 67.

Figure 67: Pakistan’s protech export (million US\$) to the world, country wise breakdown ⁽²⁾



The major export products include knitted gloves (90 per cent) and knitted gloves (9 per cent) etc. Pakistan's imports in this category are mainly from China (60 per cent), UAE (22 per cent) and USA (3 per cent). The imports include products such as garment made up of non-knitted fabrics (58 per cent), life jackets (23 per cent) and garments made up of knitted fabrics (19 per cent), etc.

Figure 68: Pakistan's protech export versus import (thousand US\$) comparison (2015-19) ⁽²⁾



Pakistan's exports in the protech category are continuously increasing as the exports amounted to US\$161 million in 2019. Pakistan is a net exporter in this category. In the last five years, imports remained consistent amounting to US\$3.0 million in 2019.

2.11.1.11 Sportech

Calculated on the basis of ten HS codes given in table 25, the total global trade volume in this category is US\$12.8 billion. Pakistan exported US\$44 million in 2019, which is 0.35 per cent of the total global trade. In the same year Pakistan imported US\$6.2 million worth of goods.

Table 25. HS codes of main products included in sportech category

S code	Product description
5608	Twine, cordage or rope; knotted netting, made up fishing nets and other made-up nets, of textile materials
6112	Track suits, ski suits and swimwear; knitted or crocheted
6306	Tarpaulins, awnings and sun blinds; tents; sails for boats, sailboards or land craft; camping goods
8801	Balloons and dirigibles; gliders, hang gliders and other non-powered aircraft.
401590	Rubber; vulcanised (other than hard rubber), articles of apparel and clothing accessories (other than gloves, mittens and mitts)
630630	Sails; for boats, sailboards or land craft
630640	Camping goods; pneumatic mattresses
630690	Camping goods; (of textile materials), n.e.c in heading no. 6306
890310	Yachts and other vessels; for pleasure or sports, rowing boats and canoes, inflatable
940430	Sleeping bags

In this category, Pakistan's major export destination is the UK (24 per cent), Kenya (15 per cent) and Congo (5 per cent) etc. as shown in figure 69:



The major export products of Pakistan in sportech are Track suits, ski suits and swimwear; knitted or crocheted.

Figure 69: Pakistan's sportech export (million US\$) to the world, country wise breakdown

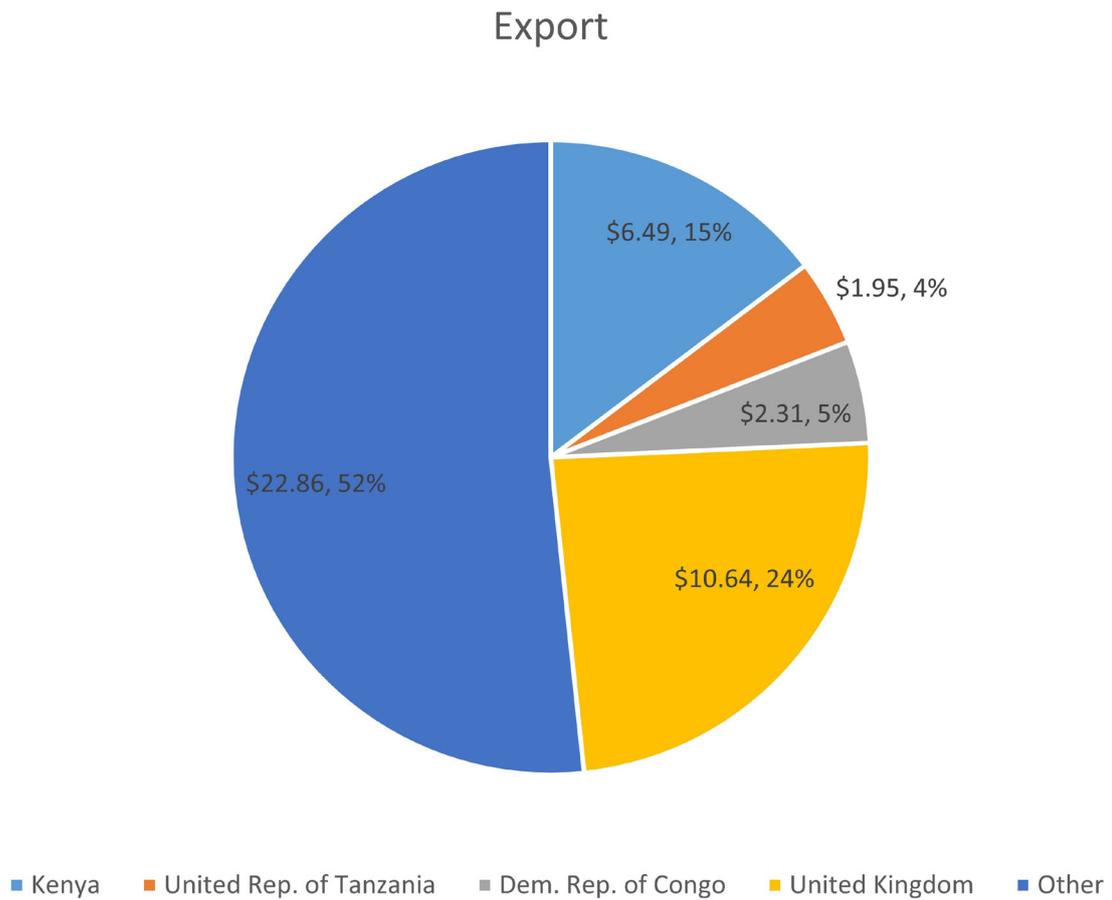
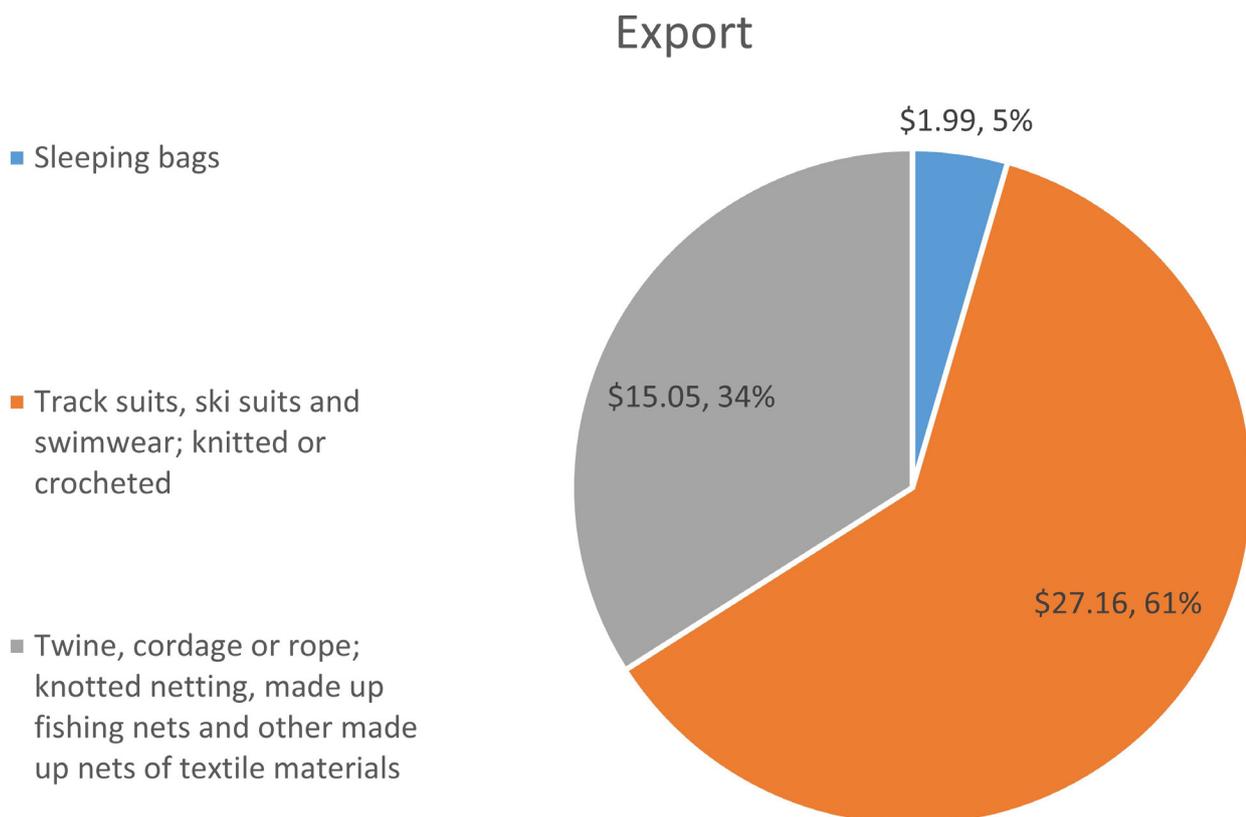


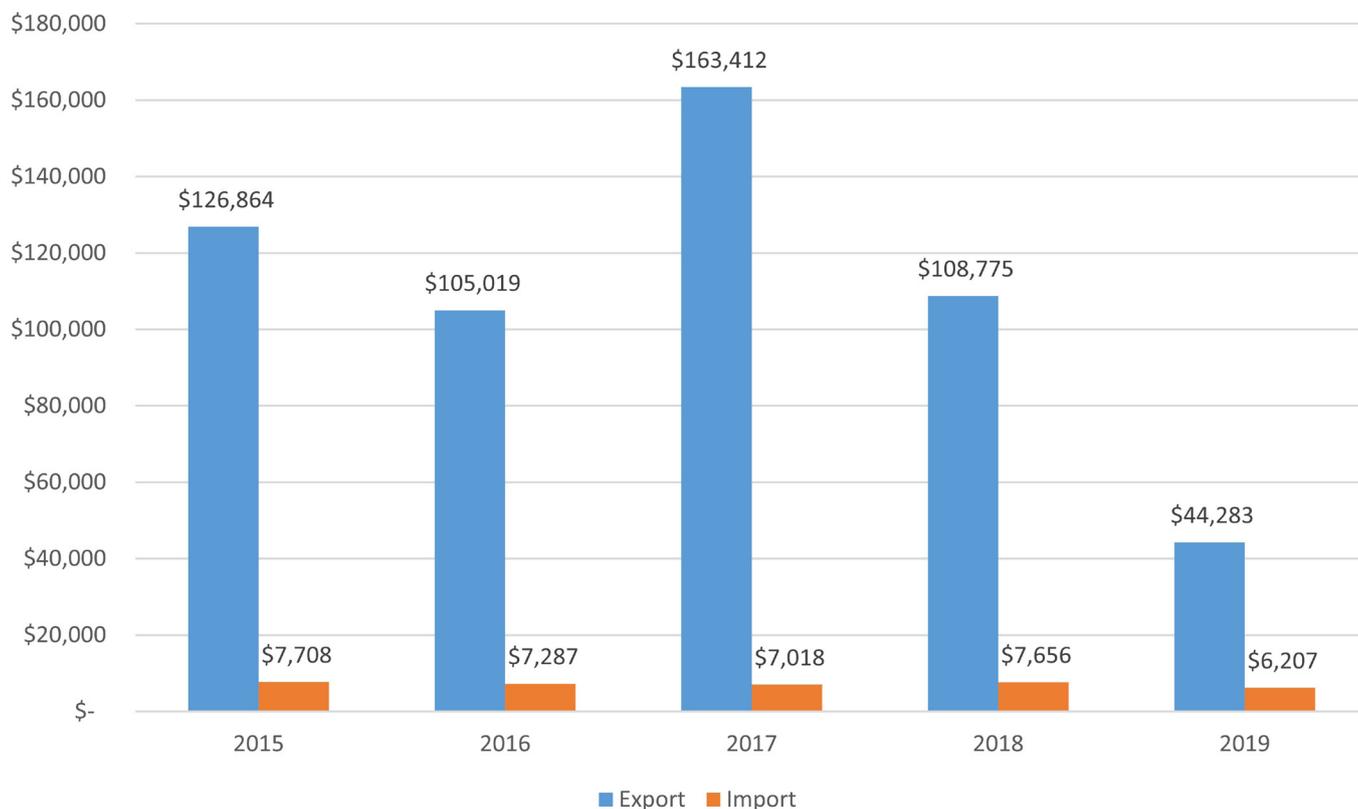
Figure 70: Pakistan's sportech export (million US\$) to the world, product wise breakdown



The major export products of Pakistan in this category include knitted track suits (61 per cent) and nets and other made-up nets (34 per cent) etc. as shown in figure 70.

Pakistan’s main import partners in this category include China (72 per cent), India (8 per cent), Thailand and Iran (6 per cent). With regards to imports, the main products include twine, cordage (88 per cent) and rubber; vulcanized, articles of apparel, etc. (9 per cent).

Figure 71: Pakistan’s sportech export and import (thousand US\$) comparison (2015-19) ⁽²⁾



As shown in figure 71, Pakistan is a net exporter in the category of sportech. Import in this category remains almost same equivalent to US\$6.2 million. Exports in this category are decreasing and achieved a value of US\$44 million in 2019.

2.11.1.12 Geotech

In general, geotech is exported/imported in a rolled or fabric form and it is very difficult to distinguish between the commodity codes of fabrics used in geotechnical applications and other technical fabrics that will be converted to end-products. Hence, any technical textile end-products traded as rolled goods were considered in the analysis under the technical fabrics section and not under the end-products.

2.11.2 Product wise analysis

2.11.2.1 Technical fibers

The volume of world exports in this category is US\$6.7 billion. Pakistan’s exports in this category are nil, however, its imports were US\$40 million in 2019. This calculation is based on the six HS codes given in table 26.

US\$6.7 billion

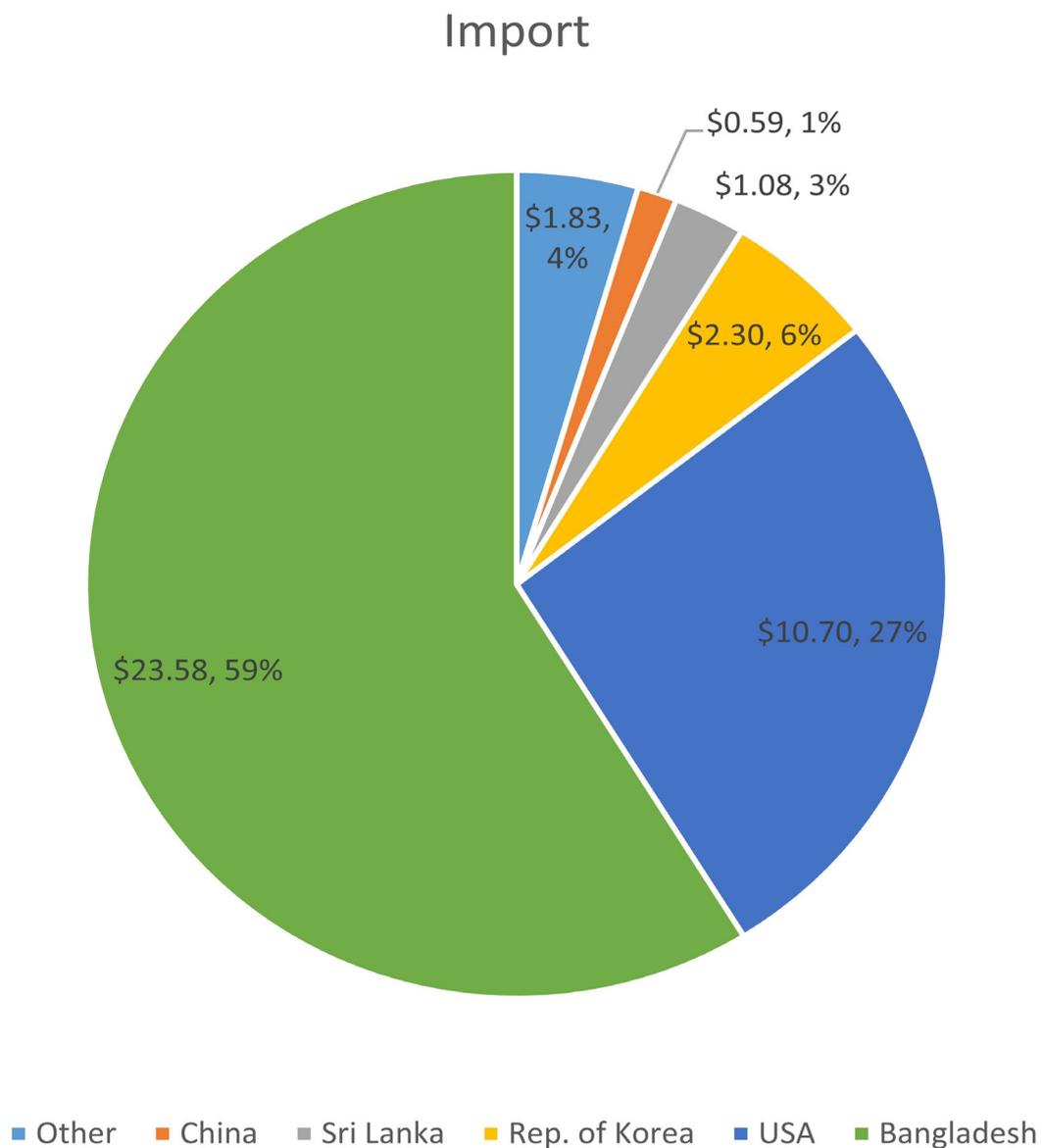
The volume of world exports in this category

Table 26. HS Codes of main products included in the technical fibers category

HS code	Product description
550311	Fibres; synthetic staple fibres, of aramids, not carded, combed or otherwise processed for spinning
5303	Jute and other textile bast fibres (not flax, true hemp and ramie), raw or processed but not spun; tow and waste of these fibres, including yarn waste and garneted stock
550340	Fibres; synthetic staple fibres, of polypropylene, not carded, combed or otherwise processed for spinning
5305	Coconut, abaca (manila hemp or <i>Musa textilis</i> nee), ramie and other vegetable textile fibres n.e.c., raw or processed but not spun; tow, noils and waste of these fibres (including yarn waste and garneted stock)
550319	Fibres; synthetic staple fibres, of nylon or other polyamides other than aramids, not carded, combed or otherwise processed for spinning

Pakistan imports technical fibers mainly from Bangladesh (59 per cent) followed by USA (27 per cent) and the Republic of Korea (6 per cent).

Figure 72: Pakistan's technical fiber import (million US\$) from the world, country wise breakdown ⁽²⁾

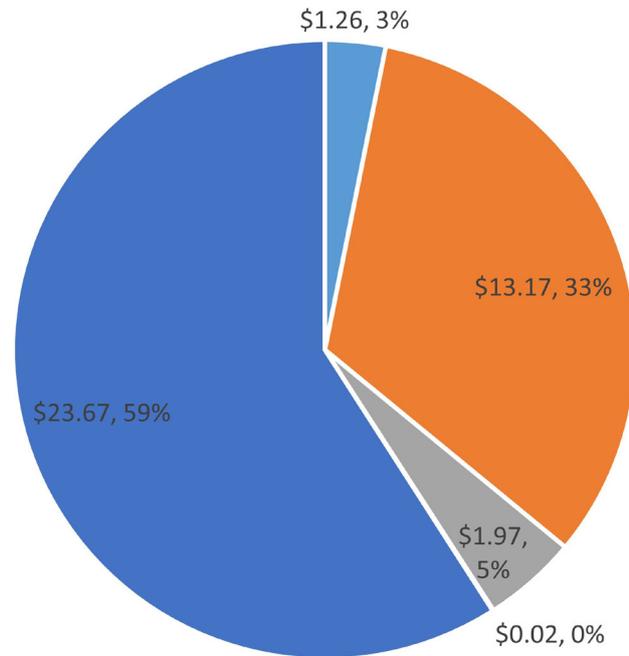


The major import products of Pakistan in this category include jute (59 per cent) and aramid fibers (33 per cent).

Figure 73: Pakistan's technical fiber import (million US\$) from the world, product wise breakdown ⁽²⁾

Import

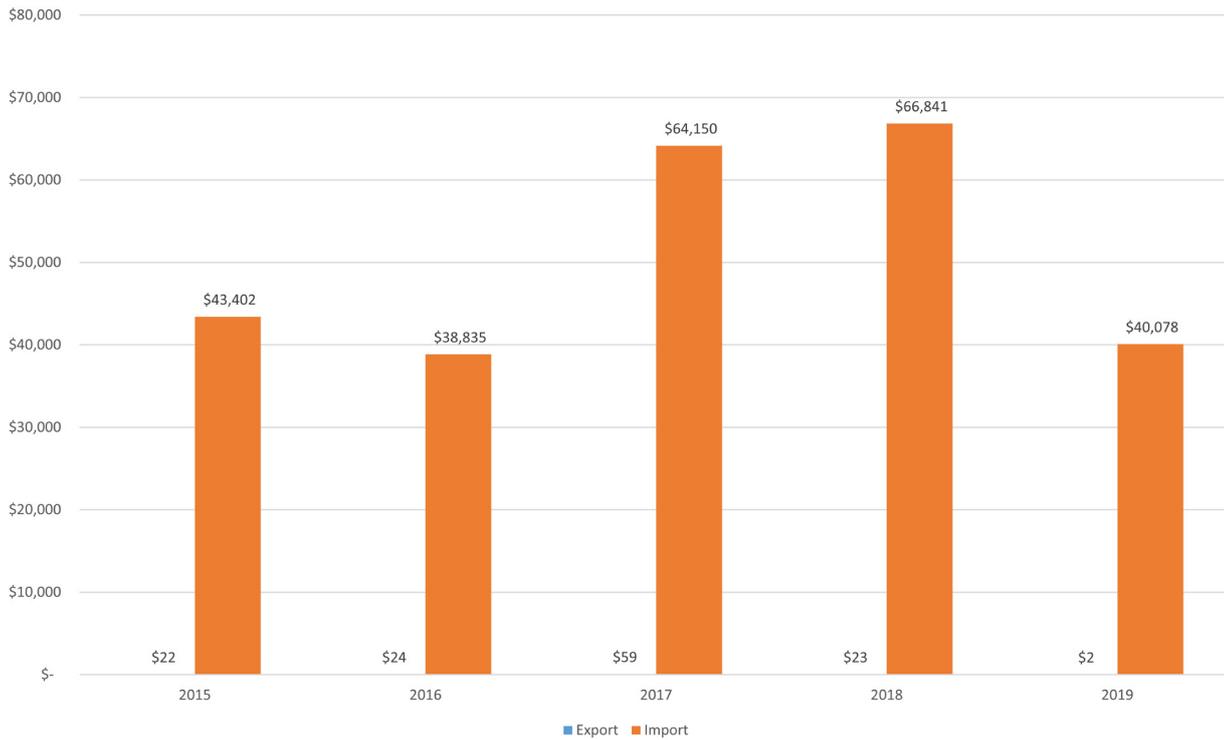
- Coconut, abaca (Manila hemp or *Musa textilis* Nee), ramie and other vegetable textile fibres n.e.c., raw or processed but not spun; tow, noils and waste of these fibres (including yarn waste and garnetted stock)
- Fibres; synthetic staple fibres, of aramids, not carded, combed or otherwise processed for spinning
- Fibres; synthetic staple fibres, of nylon or other polyamides other than aramids, not carded, combed or otherwise processed for spinning
- Fibres; synthetic staple fibres, of polypropylene, not carded, combed or otherwise processed for spinning
- Jute and other textile bast fibres (not flax, true hemp and ramie), raw or processed but not spun; tow and waste of these fibres, including yarn waste and garnetted stock



As shown in figure 73, the major import products of Pakistan in this category include jute (59 per cent) and aramid fibers (33 per cent).



Figure 74: Pakistan's technical fiber import (thousand US\$) and exports comparison (2015-19) ⁽²⁾



Pakistan's exports are almost zero in this category with imports at an all-time high of US\$66.8 million in 2018 (Figure 74). However, this value decreased to US\$40 million in 2019.

2.11.2.2 Technical yarns

Global export market of this category is US\$16 billion. This is calculated on the basis of 16 HS codes given in table 27. Pakistan's total exports in this category are US\$0.5 million in 2019. In the same year Pakistan imported technical yarns worth US\$14.9 million .

Pakistan imported technical yarns worth US\$14.9 million in 2019.

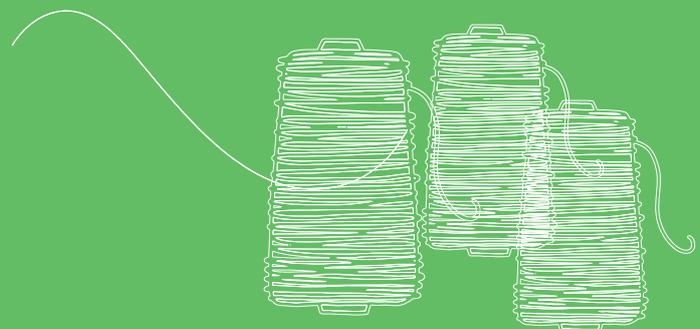
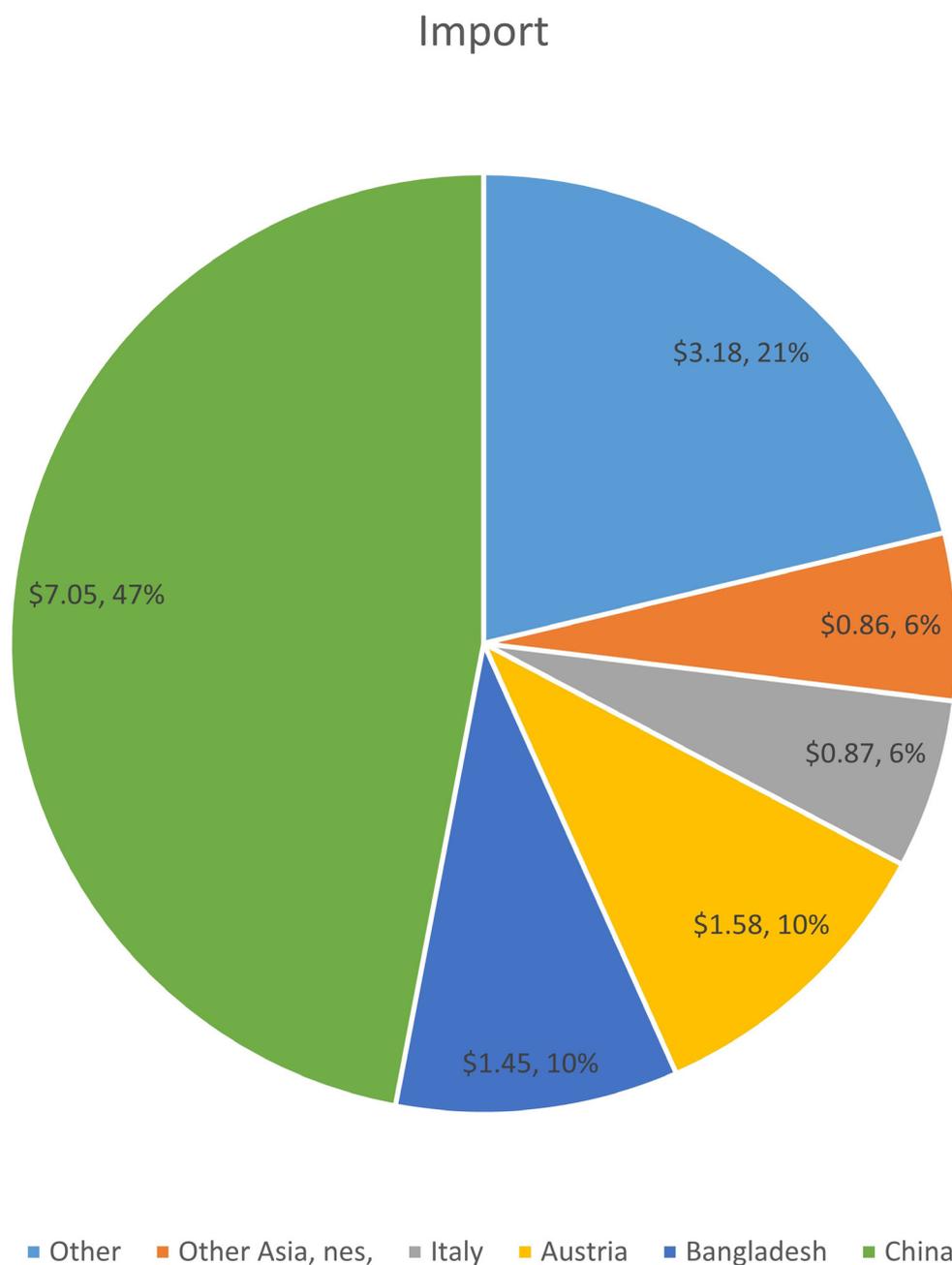


Table 27. HS Codes of main products included in technical yarns category

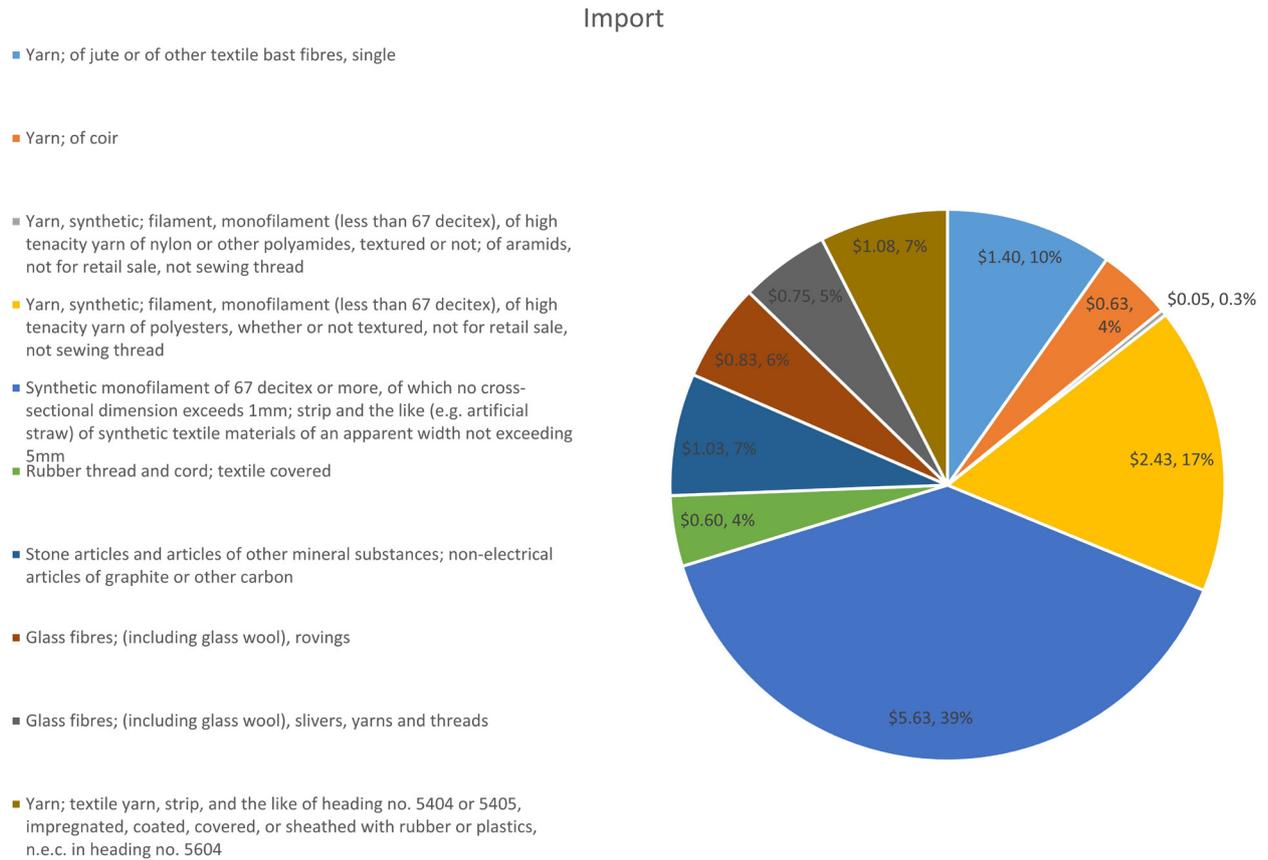
HS code	Product description
540219	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity nylon or other polyamides, textured or not; other than aramids, not for retail sale, not sewing thread
5404	Synthetic monofilament of 67 decitex or more, of which no cross-sectional dimension exceeds 1mm; strip and the like (e.g. artificial straw) of synthetic textile materials of an apparent width not exceeding 5mm
530890	Yarn; of vegetable textile fibres n.e.c. in heading no. 5306, 5307 and 5308
701919	Glass fibres; (including glass wool), slivers, yarns and threads
540220	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity polyesters, not for retail sale, not sewing thread
560410	Rubber thread and cord; textile covered
560490	Yarn; textile yarn, strip, and the like of heading no. 5404 or 5405, impregnated, coated, covered, or sheathed with rubber or plastics, n.e.c. in heading no. 5604
540211	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity nylon or other polyamides, of aramids, not for retail sale, not sewing thread
540219	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity nylon or other polyamides, other than aramids, not for retail sale, not sewing thread
540211	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity yarn of nylon or other polyamides, textured or not; of aramids, not for retail sale, not sewing thread
540220	Yarn, synthetic; filament, monofilament (less than 67 decitex), of high tenacity yarn of polyesters, whether or not textured, not for retail sale, not sewing thread
701912	Glass fibres; (including glass wool), rovings
681510	Stone articles and articles of other mineral substances; non-electrical articles of graphite or other carbon
530710	Yarn; of jute or of other textile bast fibres, single
681510	Stone articles and other mineral substances, non-electrical articles of graphite or other carbon
540310	Yarn, artificial; filament, monofilament (less than 67 decitex), of high tenacity viscose rayon, not for retail sale, not sewing thread

Figure 75: Pakistan's technical yarn import (million US\$) from the world, country wise breakdown ⁽²⁾



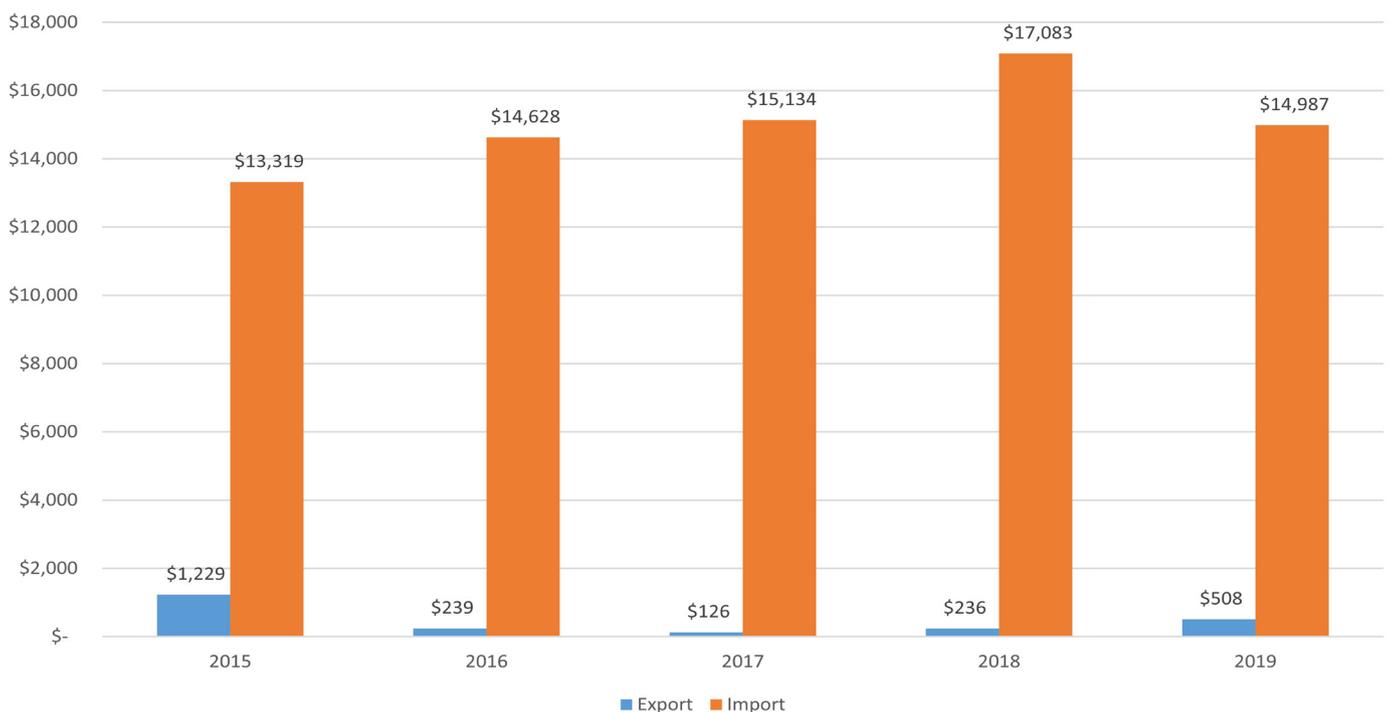
Pakistan's major import partner in this category is China (47 per cent), Bangladesh (10 per cent) and Austria etc. as shown in figure 75.

Figure 76: Pakistan's technical yarn import (million US\$) from the world, product wise breakdown ⁽²⁾



The major imported products by Pakistan in this category include: synthetic monofilament of 67 decitex or more (39 per cent), glass fibers (11 per cent), rubber thread and cord; textile covered (5 per cent) and carbon fibers (7 per cent) as shown in figure 76.

Figure 77: Pakistan's technical yarn import (thousand US\$) and exports comparison (2015-19) ⁽²⁾



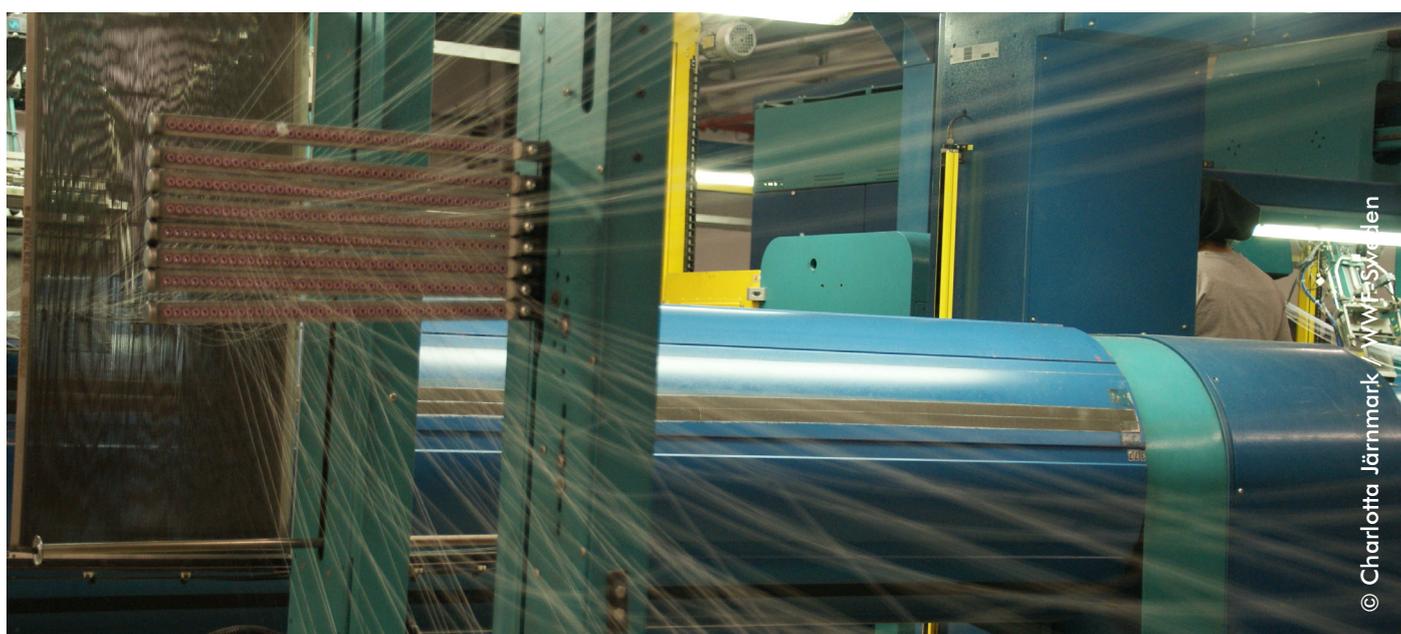
The import in technical yarn category was increasing till 2018 to achieve a higher value of US\$17 million. This value decreased to US\$14 million in 2019 (figure 77).

2.11.2.3 Technical fabrics

The global export market of this category is US\$12.5 billion. This is calculated on the basis of four HS codes given in table 28. Pakistan’s total exports in this category are US\$6.5 million in 2019. In the same year, Pakistan imported technical yarns worth US\$62 million.

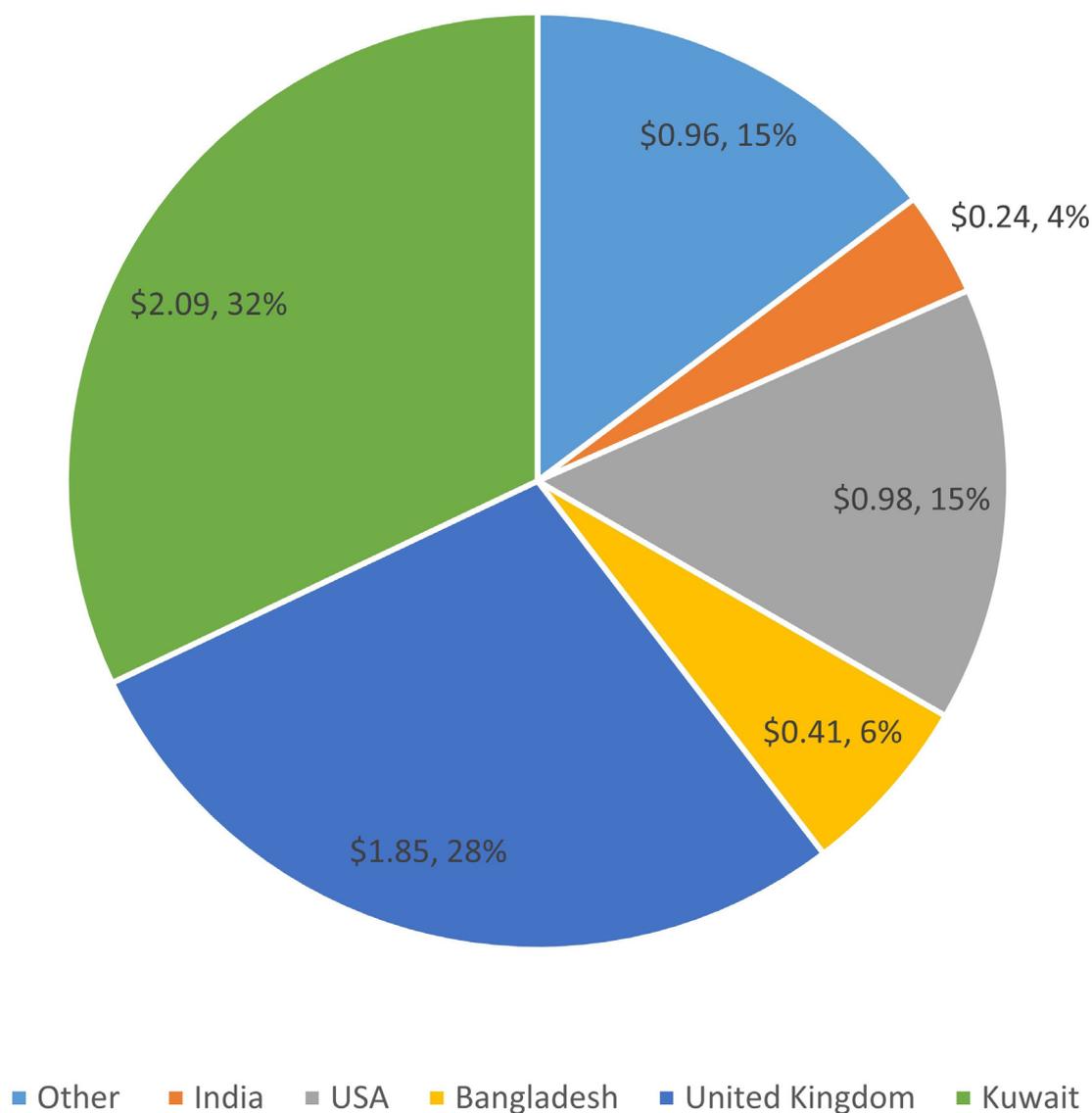
Table 28. HS codes of main products included in technical fabrics category

HS Code	Product Description
5903	Textile fabrics impregnated, coated, covered or laminated with plastics, other than those of heading no. 5902
591110	Textile fabric, felt and felt-lined woven fabrics, coated/covered/laminated with rubber, leather or other material, for card clothing, similar fabrics used for technical purposes, including rubber impregnated narrow velvet fabrics to cover weaving spindles
5910	Textiles; transmission or conveyor belts or belting, of textile material, whether or not impregnated, coated, covered or laminated with plastics, or reinforced with metal or other material
5907	Textile fabrics; otherwise impregnated, coated or covered; painted canvas being theatrical scenery, studio back-cloths or the like



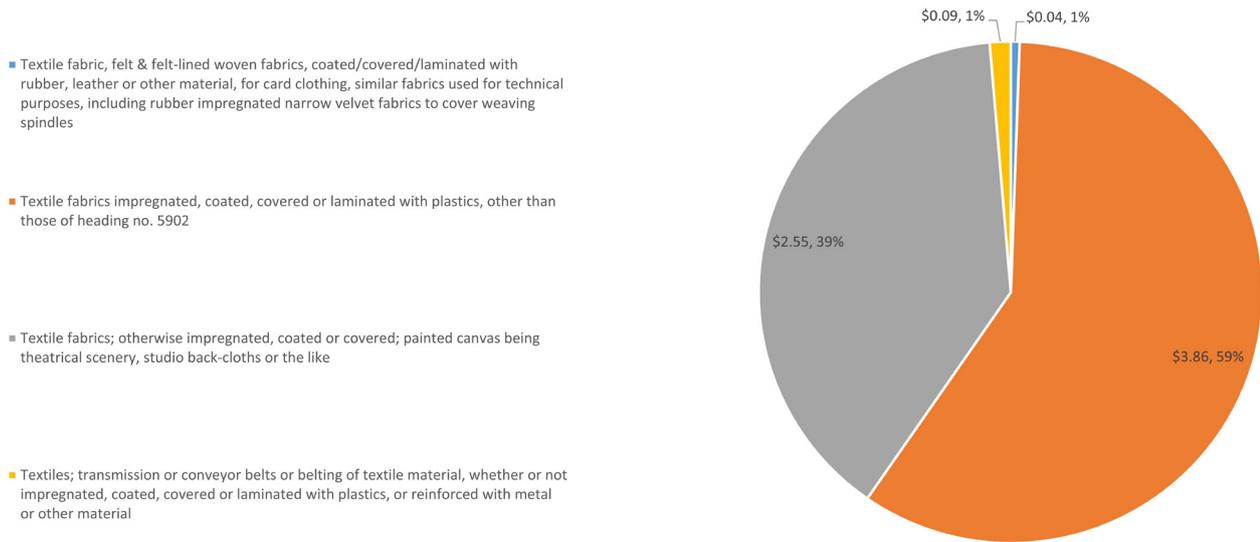
© Charlotta Järnmark WWF-Sweden

Figure 78: Pakistan's technical fabric exports (million US\$) to the world, country wise breakdown ⁽²⁾



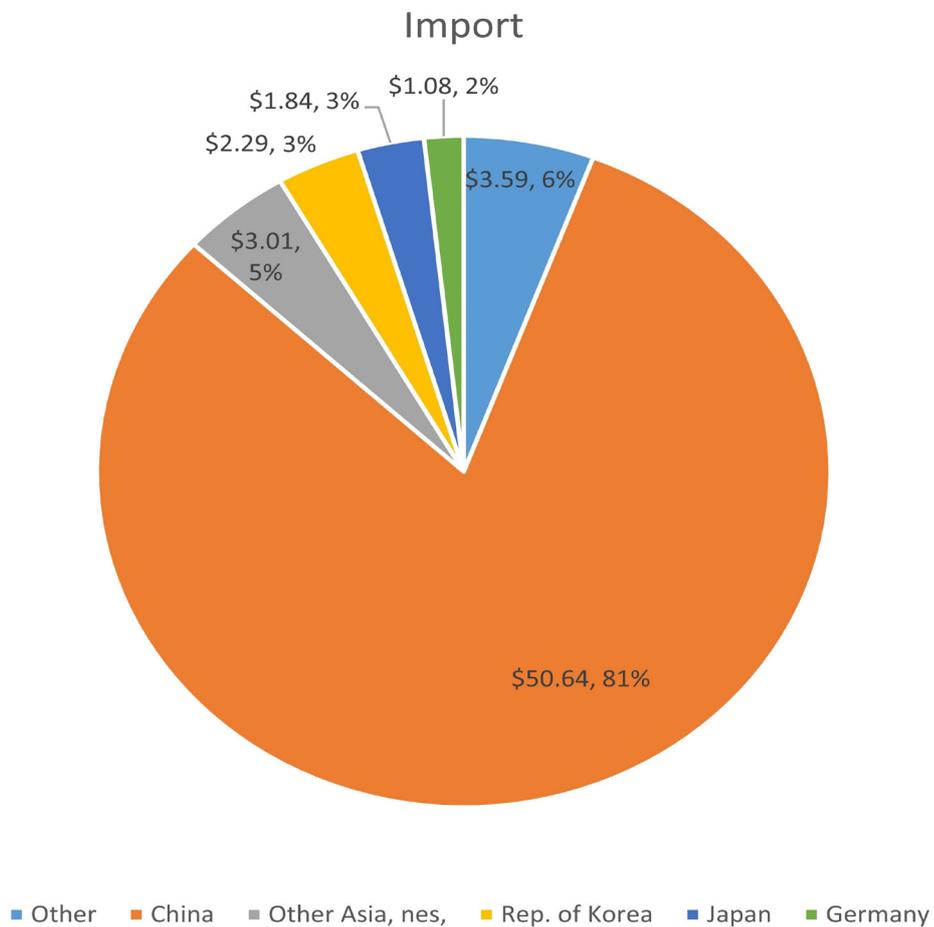
The major export destinations of Pakistan include Kuwait (32 per cent), UK (28 per cent) and USA (15 per cent) as shown in figure 78.

Figure 79: Pakistan's technical fabric exports (million US\$) to the world, product wise breakdown ⁽²⁾



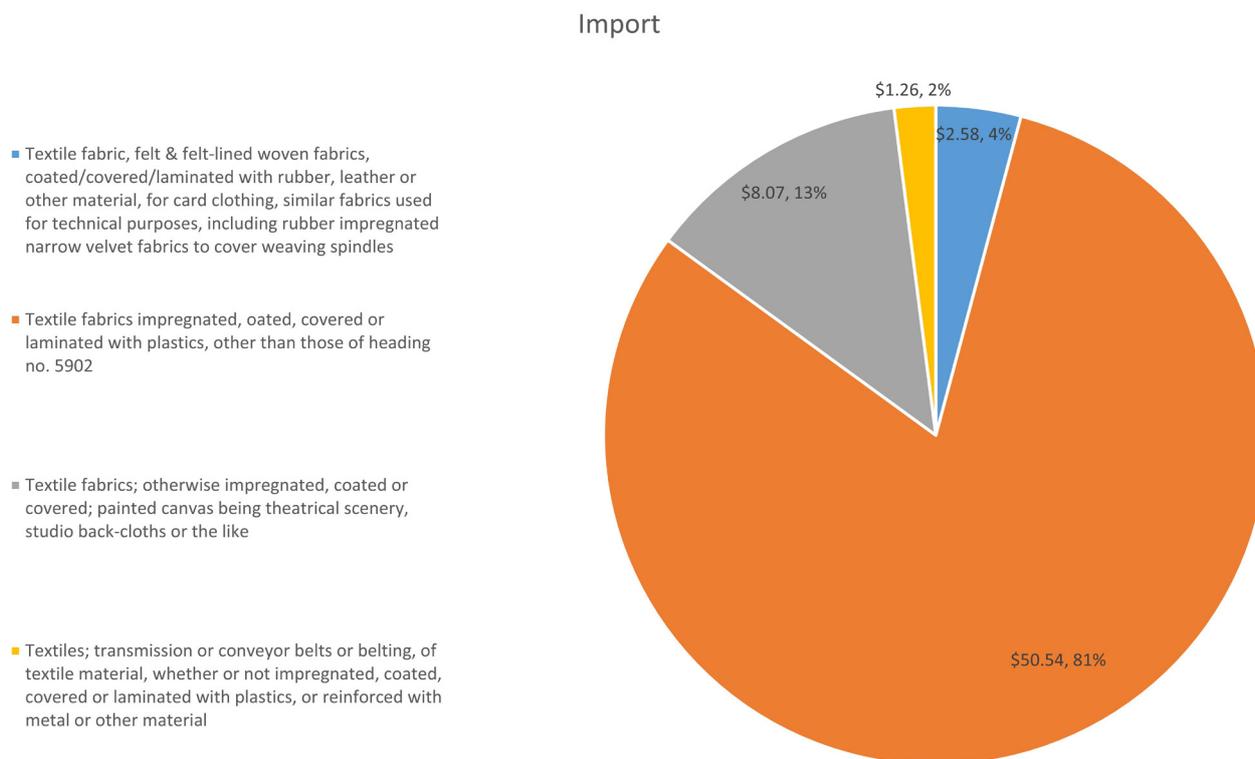
The major products exported by Pakistan in this category include impregnated textile fabrics (59 per cent), textile fabrics; otherwise impregnated, coated or covered; painted canvas etc. (39 per cent) as shown in figure 79.

Figure 80: Pakistan's technical fabric imports (million US\$) from the world, country wise breakdown ⁽²⁾



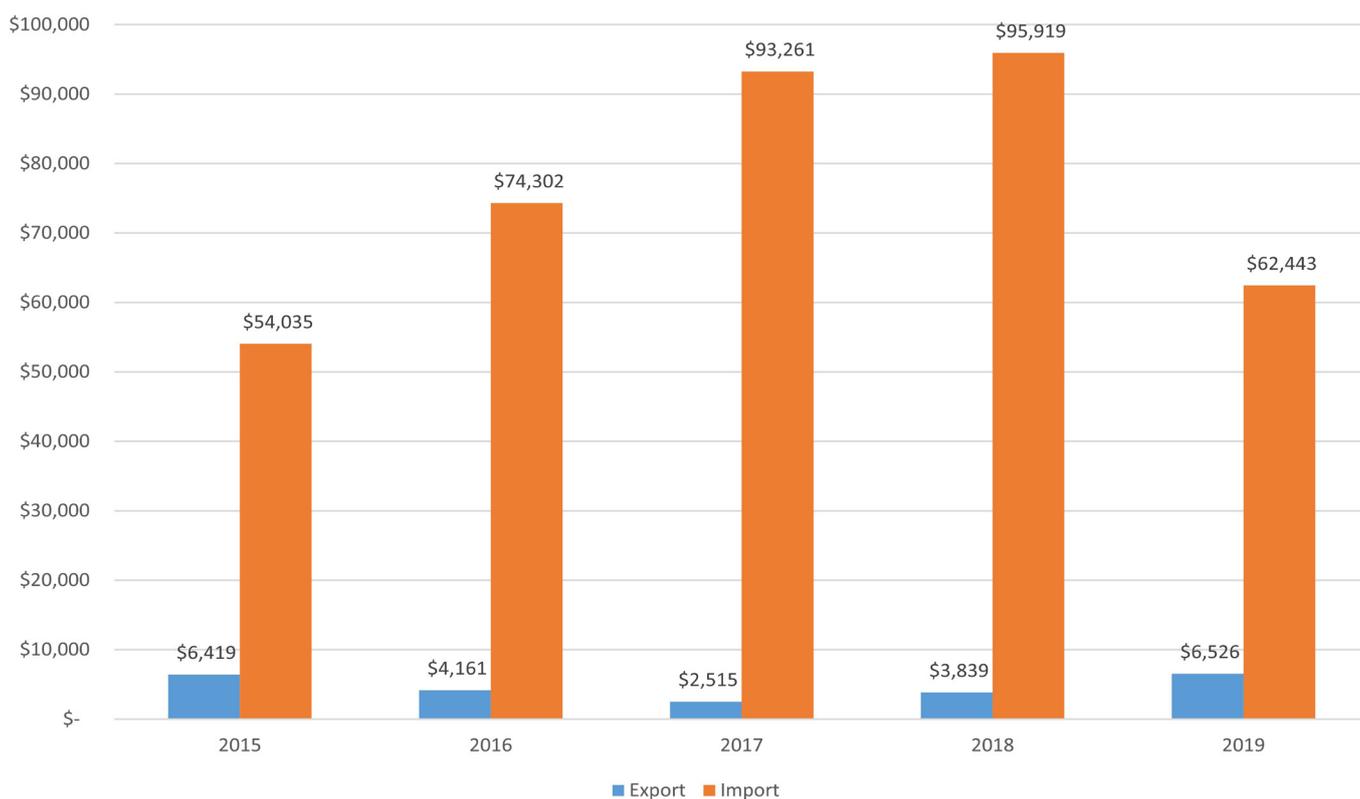
The major imports of Pakistan in this category are from China (81 per cent) as shown figure 80.

Figure 81: Pakistan's technical fabric imports (million US\$) from the world, product wise breakdown ⁽²⁾



The major imported products by Pakistan in this category include: impregnated textiles fabrics (81 per cent), textile fabrics; otherwise impregnated, coated or covered; painted canvas etc. (13 per cent) as shown in figure 81.

Figure 82: Pakistan's technical fabric import and export (thousand US\$) from the world, product wise breakdown ⁽²⁾



The export of Pakistan in this category reached a maximum value of US\$6.5 million in 2019 as shown in figure 82. The imports in this category reached a maximum value of US\$95.9 million in 2018, however, the import value decreased to US\$62 million in 2019.

2.12 Major findings

As mentioned in table 17 and 18, the total market value of technical textiles is about US\$211 billion. The exports of Pakistan are about US\$454 million which is 0.215 per cent of the global market. At the same time Pakistan imports about US\$313 million worth of technical textiles.

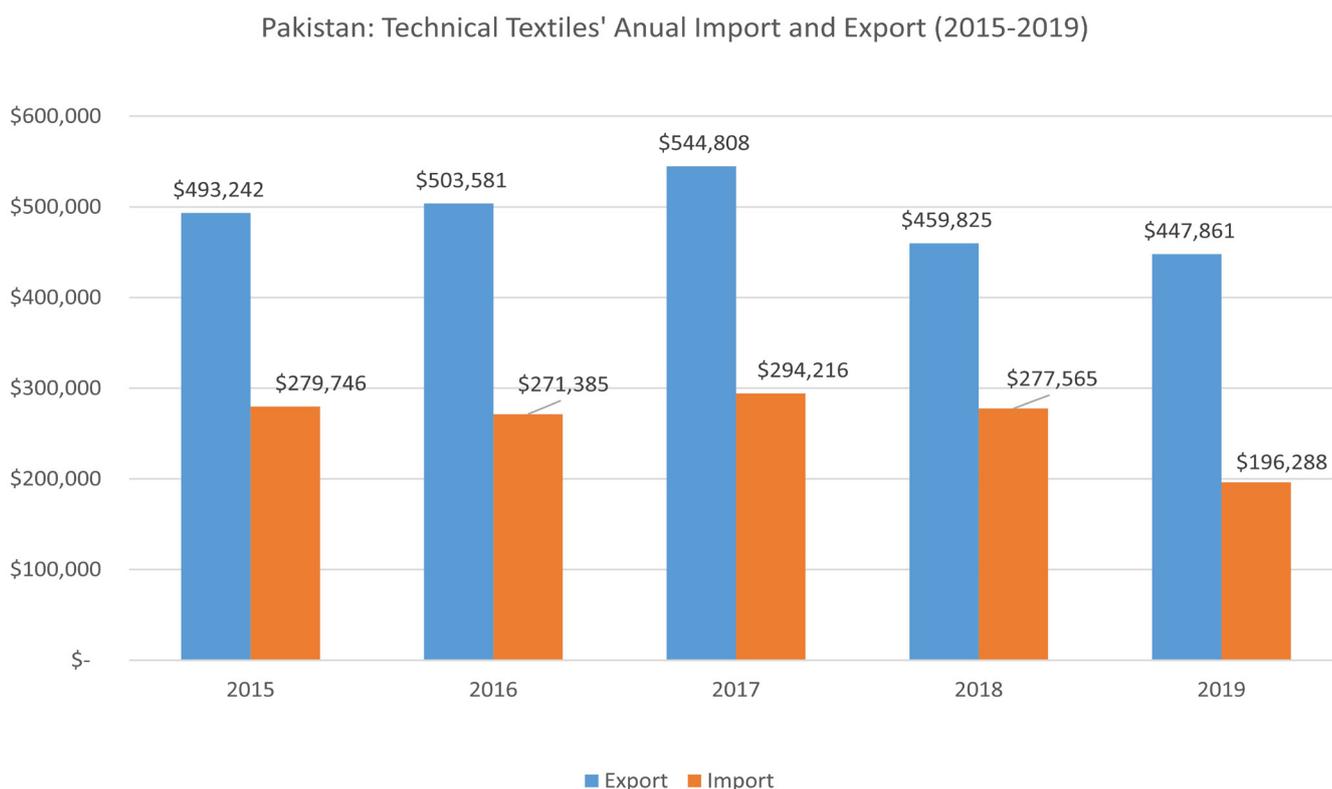
The category-wise and product-wise analysis is given below:

The technical textiles exports of Pakistan are about US\$454 million which is 0.215 per cent of the global market.

2.12.1 Category-wise technical textiles in Pakistan (2015-2019)

Pakistan remained a net exporter of technical textiles in the last five years (figure 83). Pakistan’s technical textile exports remained in the range of US\$500±50 million. The maximum export value of Pakistan in technical textiles was US\$544 million in 2017, whereas the export value in 2019 was US\$447 million. Pakistan’s imports varied between US\$294 million in 2017 and US\$196 million in 2019, which is the minimum value of imports in the last five years.

Figure 83: Pakistan’s technical textile exports and imports (thousand US\$) comparison ⁽²⁾



As shown in figure 84, Pakistan's average exports over the last five years in sportech and protech is more than US\$150 million, buildtech is about US\$100 million and packtech about US\$80 million. Exports in other categories were not very significant.

As shown in figure 85, Pakistan's average imports over a period of five years in medtech is more than US\$120 million, clothtech is about US\$50 million and mobiltech about US\$40 million. Imports in other categories were not very significant.



Figure 84: Pakistan's category wise technical textiles export (thousand US\$) (2015-19) ⁽²⁾

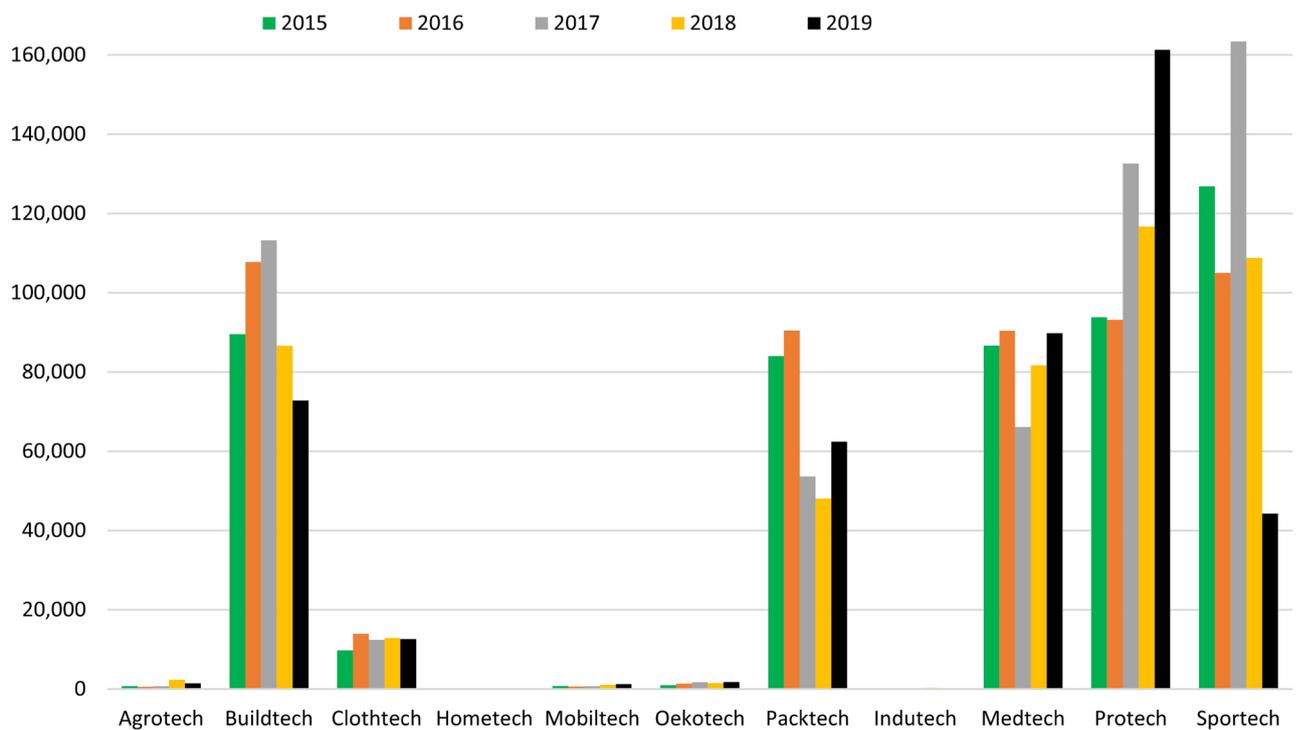
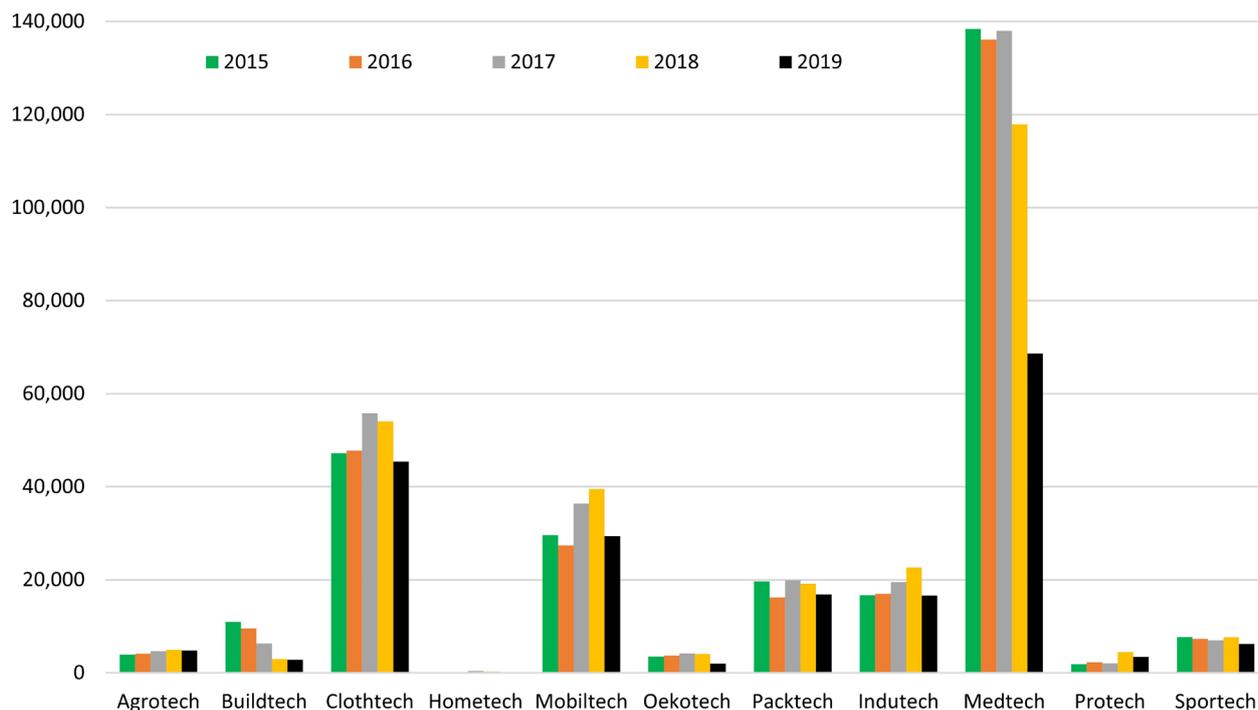


Figure 85: Pakistan's category wise technical textile imports (thousand US\$) (2015-19) ⁽²⁾



2.12.2 Product-wise technical textiles (2019)

The top 15 (with respect to market volume) technical textile products are shown in table 29 including the technical textile category, HS code, world exports in thousand US\$, Pakistan's export (thousand US\$), percentage share in global export volume etc. These fifteen products have a global volume of US\$142 billion which is about 71 per cent of the total trade volume. Pakistan's share in these top products is only US\$164 million which is about 0.12 per cent. China remained the top exporting country in 14 out of the 15 products. Whereas the United States is the top importing country in 14 out of the 15 products. In the aforementioned top 15 products, Pakistan is neither among the top five exporters nor among the top five importers. Pakistan's share is greater than one per cent for only one HS code 6305 which is "sacks and bags, of a kind used for the packing of goods", which is equal to US\$57.7 million.

Among the top 15 products, four belong to medtech and packtech each, two products to mobiltech, protech and sportech each and one to the clothtech category.

Data about Pakistan's top 10 export products (with respect to export volume in thousand US\$) is given in table 29. The table also contains information on the given category, HS code, product names, world export (thousand US\$) in that category, Pakistan's export, Pakistan's share in percentage, top export destinations of Pakistani products and top five exporting countries in that category in the world.

Pakistan's top 10 export products account for US\$415 million, which is more than 90 per cent of Pakistan's total technical textile exports. These products are related to medtech ⁽²⁾, packtech ⁽¹⁾, protech ⁽²⁾, buildtech ⁽²⁾, sportech ⁽²⁾ and clothtech ⁽¹⁾.

If we look at the top 10 technical textile export products of Pakistan (table 30), only four of them are among the 15 high export volume products globally as given in table 29. Out of the top 10 export products (table 30), Pakistan is amongst the top five exporting countries in three products. Moreover, Pakistan's top export product is HS code 611610 (knitted gloves) worth US\$144 million, contributing 4.88 per cent export share to global trade in this category ⁽²⁾.

Table 29: Global technical textile market in thousand US\$ (top 15 products) ⁽²⁾

Sr	Category	HS Code	Product Name	World Export	Pakistan's Export	Pakistan's % Share in Global Trade (export)	Top 5 exporting countries in world	Top 5 importing countries in world
1	Medtech	9619	Sanitary towels (pads) and tampons, napkins and napkin liners for babies and similar articles, of any material	15,996,916	3,904	0.02%	China, Germany, Japan, Poland, Czech Republic	United States of America, China, Germany, United Kingdom, France
2	Packtech	420292	Cases and containers, n.e.c. in heading 4202, with outer surface of sheeting of plastics or of textile materials	14,600,857	1,352	0.01%	China, Viet Nam, Germany, France, Hong Kong, China	United States of America, Japan, Germany, France, United Kingdom
3	Packtech	420222	Cases and containers; handbags (whether or not with shoulder strap and including those without handle), with outer surface of sheeting of plastics or of textile materials	14,110,348	458	0.00%	China, France, Italy, Singapore, Viet Nam	United States of America, (Hong Kong, China), France, Italy, China
4	Packtech	420212	Cases and containers; trunks, suit-cases, vanity-cases, executive-cases, brief-cases, school satchels and similar containers, with outer surface of plastics or of textile materials	13,228,784	496	0.00%	China, Belgium, Italy, Germany, France	United States of America, Germany, United Kingdom, France, Japan
5	Medtech	630790	Textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c. in heading no. 6307	12,405,248	47,635	0.38%	China, Germany, United States of America, Viet Nam, Mexico	United States of America, Japan, Germany, France, United Kingdom
6	Mobiltech	870895	Vehicle parts; safety airbags with inflator system; parts thereof	11,646,478	19	0.00%	Mexico, United States of America, Germany, Poland, China	United States of America, Mexico, Germany, Japan, Poland
7	Protech	6210	Garments made up of fabrics of heading no. 5602, 5603, 5903, 5906 or 5907 (not knitted or crocheted)	10,265,314	1,919	0.02%	China, Viet Nam, Italy, Bangladesh, Belgium	United States of America, Germany, France, Japan, Saudi Arabia
8	Protech	6114	Garments; knitted or crocheted, n.e.c. in chapter 61	8,784,146	14,356	0.16%	China, Jordan, Italy, India, Viet Nam	United States of America, Germany, United Kingdom, France, Spain
9	Medtech	3005	Wadding, gauze, bandages (dressings, adhesive plasters, poultices), impregnated or coated with pharmaceutical substances or in forms or packings for retail sale, for medical, surgical or veterinary use	8,395,945	4,571	0.05%	China, United Kingdom, Germany, United States of America, Belgium	United States of America, Germany, France, United Kingdom, Netherlands
10	Mobiltech	5703	Carpets and other textile floor coverings; tufted, whether or not made up	7,175,698	624	0.01%	China, Belgium, Netherlands, United States of America, India	United States of America, United Kingdom, Canada, Germany, Japan
11	Packtech	6305	Sacks and bags, of a kind used for the packing of goods	5,413,944	57,783	1.07%	China, India, Viet Nam, Turkey, Thailand	United States of America, Japan, (Korea, Republic of), Germany, France
12	Sportech	6112	Track suits, ski suits and swimwear; knitted or crocheted	5,295,855	27,162	0.51%	China, Viet Nam, Germany, Hong Kong, China, France	United States of America, Germany, United Kingdom, France, Italy
13	Sportech	6306	Tarpaulins, awnings and sunblinds; tents; sails for boats, sailboards or landcraft; camping goods	5,169,724	-	0.00%	China, Germany, Bangladesh, Poland, Netherlands	United States of America, Germany, France, United Kingdom, Netherlands
14	Medtech	300610	Pharmaceutical goods; sterile surgical catgut, suture materials, tissue adhesives, laminaria, laminaria tents, absorbable surgical or dental haemostatics, and surgical or dental adhesion barriers	4,933,447	66	0.00%	United States of America, Belgium, Germany, Austria, Switzerland	Belgium, Germany, United States of America, Japan, Singapore
15	Clothtech	5806	Fabrics; narrow woven, other than goods of heading no. 5807; narrow fabrics consisting of warp without weft assembled by means of an adhesive (bolducs)	4,471,319	3,430	0.08%	China, (Hong Kong, China), United States of America, Germany, Taipei, Chinese	United States of America, Mexico, Hong Kong, China, Viet Nam, China
				141,894,023	163,775	0.12%		

Table 30: Technical textile exports in thousand US\$ by Pakistan (top 10 products) ⁽²⁾

Sr.	Category	HS Code	Product Name	World Export	Pakistan's Export	Pakistan's % Share in Global Trade (export)	Top Countries (for Pakistan export)	Top 5 exporting countries in world
1	Protech	611610	Gloves, mittens and mitts; knitted or crocheted, impregnated, coated or covered with plastics or rubber	2,958,651	144,326	4.88%	USA, United Kingdom, Netherlands	China, Sri Lanka, Belgium, Viet Nam, Pakistan
2	Packtech	6305	Sacks and bags, of a kind used for the packing of goods	5,413,944	57,783	1.07%	Afghanistan, USA, Germany	China, India, Viet Nam, Turkey, Thailand
3	Medtech	630790	Textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c. in heading no. 6307	12,405,248	47,635	0.38%	USA, Germany, United Kingdom	China, Germany, United States of America, Viet Nam, Mexico
4	Buildtech	630629	Tents; of textile materials other than synthetic fibres	320,489	46,315	14.45%	Saudi Arabia, United Arab Emirates, Kuwait	China, Pakistan , South Africa, United States of America, Netherlands
5	Medtech	611510	Graduated compression hosiery (for example, stockings for varicose veins), knitted or crocheted	536,403	33,609	6.27%	USA, Germany, United Kingdom	Germany, Italy, United States of America, Pakistan , Switzerland
6	Sportech	6112	Track suits, ski suits and swimwear; knitted or crocheted	5,295,855	27,162	0.51%	United Kingdom, USA, Germany	China, Viet Nam, Germany, Hong Kong, China, France
7	Buildtech	630612	Tarpaulins, awnings and sunblinds; of synthetic fibres	1,381,457	20,099	1.45%	USA, Kenya, Syria	China, Germany, Poland, France, Netherlands
8	Sportech	5608	Twine, cordage or rope; knotted netting, made up fishing nets and other made up nets, of textile materials	1,987,046	15,050	0.76%	Kenya, Dem. Rep. of the Congo, United Rep. of Tanzania	China, Viet Nam, Thailand, Japan, India
9	Protech	6114	Garments; knitted or crocheted, n.e.c. in chapter 61	8,784,146	14,356	0.16%	USA, France, United Arab Emirates	China, Jordan, Italy, India, Viet Nam
10	Clothtech	5807	Labels, badges and similar articles; of textile materials, in the piece, in strips or cut to shape or size, not embroidered	1,323,748	9,006	0.68%	USA, France, United Kingdom	China, (Hong Kong, China), Korea, Republic of, Italy, Taipei, Chinese
				40,406,987	415,342	1.03%		

 among top 15 export Products globally

Table 31: Technical textile imports in thousand US\$ by Pakistan (top 10 products) ⁽²⁾

Sr.	Category	HS Code	Product Name	World Export	Pakistan Export	Pakistan Import	Pakistan's % Share in Global Trade (import)	Top Exporters to Pakistan	Top 5 exporting countries in world	Top 5 importing countries in world
1	Medtech	9619	Sanitary towels (pads) and tampons, napkins and napkin liners for babies and similar articles, of any material	15,996,916	3,904	39,159	0.24%	Egypt, China, Turkey	China, Germany, Japan, Poland, Czech Republic	United States of America, China, Germany, United Kingdom, France
2	Clothtech	9607	Slide fasteners and parts thereof	3,125,149	150	24,763	0.79%	China, Bangladesh, Indonesia	China, (Hong Kong, China), Japan, Taipei, Chinese, Italy	Viet Nam, China, Hong Kong, China, Bangladesh, Cambodia
3	Mobiltech	590210	Textile fabrics; tyre cord of high tenacity yarn of nylon or other polyamides	1,216,105	0	15,473	1.27%	China, USA, Belgium	China, Viet Nam, Taipei, Chinese, Turkey, Indonesia	India, United States of America, Thailand, Indonesia, Korea, Republic of
4	Clothtech	5807	Labels, badges and similar articles; of textile materials, in the piece, in strips or cut to shape or size, not embroidered	1,323,748	9,006	13,155	0.99%	China, China, Hong Kong SAR, United Arab Emirates	China, (Hong Kong, China), Korea, Republic of, Italy, Taipei, Chinese	Viet Nam, Hong Kong, China, Cambodia, Indonesia, Bangladesh
5	Medtech	300610	Pharmaceutical goods; sterile surgical catgut, suture materials, tissue adhesives, laminaria, laminaria tents, absorbable surgical or dental haemostatics, and surgical or dental adhesion barriers	4,933,447	66	10,195	0.21%	Germany, USA, China	United States of America, Belgium, Germany, Austria, Switzerland	Belgium, Germany, United States of America, Japan, Singapore
6	Medtech	630790	Textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c. in heading no. 6307	12,405,248	47,635	9,024	0.07%	China, Turkey, Bangladesh	China, Germany, United States of America, Viet Nam, Mexico	United States of America, Japan, Germany, United Kingdom
7	Packtech	420212	Cases and containers; trunks, suit-cases, vanity-cases, executive-cases, brief-cases, school satchels and similar containers, with outer surface of plastics or of textile materials	13,228,784	496	8,606	0.07%	China, United Arab Emirates, Turkey	China, Belgium, Italy, Germany, France	United States of America, Germany, United Kingdom, France, Japan
8	Mobiltech	5703	Carpets and other textile floor coverings; tufted, whether or not made up	7,175,698	624	7,864	0.11%	China, United Arab Emirates, Iran	China, Belgium, Netherlands, United States of America, India	United States of America, United Kingdom, Canada, Germany, Japan
9	Clothtech	5806	Fabrics; narrow woven, other than goods of heading no. 5807; narrow fabrics consisting of warp without weft assembled by means of an adhesive (bolducs)	4,471,319	3,430	7,508	0.17%	China, Indonesia, Malaysia	China, (Hong Kong, China), United States of America, Germany, Taipei, Chinese	United States of America, Mexico, Hong Kong, China, Viet Nam, China
10	Medtech	3005	Wadding, gauze, bandages (dressings, adhesive plasters, poultices), impregnated or coated with pharmaceutical substances or in forms or packings for retail sale, for medical, surgical or veterinary use	8,395,945	4,571	7,312	0.09%	China, Japan, Germany	China, United Kingdom, Germany, United States of America, Belgium	United States of America, Germany, France, United Kingdom, Netherlands
				72,272,359	69,882	143,059	0.20%			

 among top 15 export Products globally

3

SWOT ANALYSIS OF PAKISTAN'S TECHNICAL TEXTILES VALUE CHAIN

In this section different members of the value chain were identified and several interviews were conducted to analyze the strengths, weaknesses, opportunities and threats pertaining to the technical textiles value chain in Pakistan.

3.1 Strengths

The analysis indicates that the technical textile value chain of Pakistan has unique strengths that can support the growth of this industry.

1. A very integral factor is the low cost of doing business in Pakistan as it is regarded as one of the countries with the lowest comparative labour costs. Low labour cost is an important aspect when taking into account the cost of production, especially in the labour-intensive technical textile industries such as weaving, knitting and garment manufacturing.
2. Similarly, the cost of utilities in Pakistan was a bit higher as compared to regional countries, however, recently with the government of Pakistan announcing relief packages for industries in which the cost of commercial electricity and peak-hour charges are being reduced, it is comparable with regional countries. This is an important cost factor, especially in industries that consume a lot of energy, such as melt spinning of polymeric and glass fibres and polymer laid nonwovens and industries that consume a lot of water, such as, functional chemical treatment and finishing of technical fabrics.
3. While the industry in Pakistan is dominated by small and medium enterprises, there are few large businesses with economies of scale that can compete with global competitors.
4. Furthermore, the industry in Pakistan is very diverse, with a broad range of products that can meet the diverse local demand for technical textiles. There is high local demand for technical textiles in Pakistan, including, medtech, clothtech and buildtech, which is a significant strength point that can support the growth of this industry. Furthermore, there is a space in technical fibres, yarns and fabrics as well. In 2019, Pakistan imported US\$314 million worth of technical textiles.
5. Pakistan has a promising future in the export of technical textiles. It holds a strategic geographic location with proximity to the main markets consuming technical textiles such as China and India, in addition to emerging markets such as Arab Gulf countries and Africa. The country benefits from the GSP+ status, which makes it an ideal procurement platform for technical textiles, semi-processed and finished products for the European Union (EU) countries. In addition, it has several industrial free zones for export-based businesses that are distributed across the country. Pakistan also has a special export subsidy programme and draw back system to support local manufacturers in accessing international markets.

There is high local demand for technical textiles in Pakistan, including, medtech, clothtech and buildtech.



6. Pakistan also has a competitive advantage in the ability to acquire technical expertise on an independent basis. In most cases, Pakistani firms rely on acquiring the know-how from machinery manufacturers as part of the supply contract. As well, the ability to deliver technical training to strengthen the technical capacity and expertise of employees is important to the success of the industry. This type of technical training is also provided by machine manufacturers.

7. Pakistan has good infrastructure as far as electricity, utilities, IT, roads and ports are concerned. In recent years, the government has been working to improve this infrastructure to support modern industries under CPEC. In addition, the Pakistani banking system has improved considerably, and it now offers a wide range of modern services like internet banking. There are also several programs which finance the modernization of machinery and the development of exports.

8. Finally, the country has several research institutes and testing bodies that can perform tests on technical textiles, such as the SGS, TTI and National Textile University etc.

Pakistan benefits from the GSP+ status, which makes it an ideal procurement platform for technical textiles, semi-processed and finished products for the European Union (EU) countries.

3.2 Weaknesses

Despite the competitive advantages, Pakistan suffers from major weaknesses that prevent the technical textile industry from reaching its full potential.

1. The lack of technical expertise and exclusive technology can hinder the growth of this industry. Most companies in Pakistan rely on sourcing machinery for production from suppliers present in the market. Therefore, these technical resources are also available to their competitors hence depriving them of a competitive edge pertaining to manufacturing equipment. One of the key competitive advantages in the technical textile business is having a unique product that is based on proprietary technology, which comes from extensive investment in R and D and product development activities. That is not so in Pakistan. There is a lack of specialized training in technical textiles and nonwovens and a lack of expertise that can provide technical support to businesses. In addition, there is an overall lack of awareness about technical textile materials, applications and benefits and a high rate of staff turnover.

2. Another weakness is the lack of high-performance fibre, yarn and specialty fabrics providers. Advanced fibres such as carbon fibre and aramid fibre are key components in a wide range of technical textile applications, including protech. Local suppliers may have access to these types of raw materials, but they may have nonuniform quality and delayed deliveries.

3. In most cases, capital investment in technical textiles in Pakistan is high because of the high capital cost of machinery, particularly in upstream processes. The severity of this issue has increased with the devaluation of the rupee relative to the dollar as most machines are imported in dollars. In addition, high bank interest rates further complicate this issue. Moreover, most technical textile companies in Pakistan are small and medium-sized enterprises with small economies of scale.

4. Despite the availability of testing and certification centres for basic textile tests, there is a lack of testing facilities that can do advanced testing and validation of technical materials such as anti-microbial activity, fire retardant, porosity, filtration efficiency and others. This is coupled with the lack of local standards for technical textiles, which result in a high degree of uncertainty in the market.

5. Textile care is an important factor when dealing with textile goods, however, when it comes to their care, it requires special

-ized industrial laundries to be able to maintain the durability of functional treatments and coatings. The lack of industrial laundering in Pakistan is one of the key points that is limiting the potential of wearable technical textiles in Pakistan.

6. Finally, low local demand in the specialty sectors makes it very difficult to do business in areas like the automotive sector. Pakistan produces about 200,000 vehicles a year, resulting in very low local demand for automotive textiles (mobiltech).

One of the key competitive advantages in the technical textile business is having a unique product that is based on proprietary technology, which comes from extensive investment in R and D and product development activities.



3.3 Opportunities

Looking at the technical textiles value chain in Pakistan and globally, there are many opportunities that can support the upgrading of this value chain in Pakistan.

1. The growth potential of local market is very strong, due to the growing demand for technical textiles at the local level. This growing demand is primarily due to large government investments (mainly through CPEC) in infrastructure projects that use geotextiles in roads, bridges and canals. There is also a strong demand from the booming construction and building industry that uses thermal insulation, moisture insulation membranes, safety mesh and many more. Further, the demand in the health-care sector is increasing with high potential for growth in medical textiles and nonwovens. The issuance of mandatory standards or legislations could increase the local demand even higher, especially in the healthcare, construction, and protective clothing department. The increasing local demand is not accompanied by a growth in the local industry, hence why Pakistan relies on imports to fulfill this demand. The size of the local industry is still very small and the competition is low, hence there is very good potential for the local industry to grow and substitute the imported goods.
2. Not only is there potential in the local marketplace, but there is potential in export market as well. There is a growing demand in the regions such as Gulf countries and African countries and there are government incentives to increase exports.
3. The high growth potential of the local industry is also supported by numerous government programs aimed at supporting small investors. The technical textile industry has high profit margins compared to traditional textiles, and there is a very good cost advantage for local manufacturers. It is expected that the industry's successes will encourage more businesses to invest in the industry.
4. Lastly, there is potential for attracting foreign direct investment into this industry. The government has built new textile cities and Special Economic Zones (SEZs) under CPEC. Furthermore, the low exchange rate and low manufacturing costs in Pakistan make it a very attractive destination for relocation. In addition, the trade war between the United States and China will force many Chinese companies to move their companies to Pakistan to benefit from the rule of origin.

3.4 Threats

There are new challenges to the technical textiles value chain in Pakistan:

1. One of these is growing competition in the local and export markets. Competition in the local market comes mainly from low-priced imports of technical textiles from countries like China.
2. There is increased competition in export markets from other attractive manufacturing countries, such as India, Vietnam and Turkey. Turkey is a key participant in the global technical textiles market and it occupies a strategic location in terms of its proximity to Europe, familiarity with the securities industry and secure links.



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3. There is also competition that comes from the conventional textile materials in terms of price. This can be seen in disposable diapers vs. washable diapers and single use medical textiles vs. washable medical textiles.
4. Another threat is the ongoing modifications in the business environment, such as the political instability.
5. The increasing prices of utilities and energy could dilute the advantage of the low cost of doing business in Pakistan and can significantly harm the companies with high energy consumption such as the nonwoven and technical textiles industries.
6. There is also instability with respect to investment legislation.
7. There are also restrictions on the export and import of high-performance specific materials into Pakistan. This control is imposed on fibers and fabrics made of carbon, aramids etc. due to potential use of such materials in arms.
8. It is also important to note that bank interest rates change frequently and this could cause uncertainty in future investments.
9. Other threats to exporting companies include the unstable value of the rupee in relation to the US dollar, which makes the business uncertain.
10. Furthermore, removing the trade barriers and import tariffs will significantly harm local producers of technical textile end-products.
11. Lastly, fast-technological changes, an increasing protection on know-how and proprietary technologies and the difficulty in the ability to gain the technical know-how, is making local companies more reluctant to investing in this sector.

3.5 Findings of the SWOT analysis

Table 32: Summary of SWOT Analysis

Strengths	Weaknesses
<p>Low cost of doing business</p> <ul style="list-style-type: none"> o Low labor and utility cost o Economy of scale <p>Reliable suppliers of commodity raw materials</p> <ul style="list-style-type: none"> o Availability of raw materials and auxiliaries <p>High local demand of diverse products</p> <ul style="list-style-type: none"> o Strong exporting environment o Preferential free-trade agreement o Strategic geographic location for export o Availability of free zones o Export subsidy program o Draw back system <p>Possibility to acquire technical know-how</p> <ul style="list-style-type: none"> o Technical know-how and technology can be transferred o Availability of technical training o Availability of machinery agents and representatives <p>Good Infrastructure</p> <ul style="list-style-type: none"> o Roads, IT, ports, industrial zones, etc. o Good banking systems and financing programmes are part of the government 	<p>Low technical expertise</p> <ul style="list-style-type: none"> o Lack of technical know-how o No proprietary technology (R&D) o Rare technical or specialized educational programs o Few technical experts o Lack of awareness and resistance to change o Lack of trained and skilled labor o Limited design or development capabilities o High turnover in employees o Negative work attitude and culture <p>Lack of suppliers of high-performance raw materials</p> <ul style="list-style-type: none"> o Unavailability of high-performance and specialized raw materials o Local suppliers lack consistent quality and deliveries <p>Large capital investment</p> <ul style="list-style-type: none"> o Expensive machinery and equipment o Small scale companies with high-cost structure o High bank interest rates

<p>strategy</p> <p>Availability of basic testing and certification</p> <ul style="list-style-type: none"> o Availability of international standards o Availability of testing bodies for basic tests o Availability of certification bodies 	<p>Lack of advanced testing and certification</p> <ul style="list-style-type: none"> o Lack of local standards and testing facilities <p>Lack of industrial laundering and care</p> <p>Bureaucracy</p>
Opportunities	Threats
<p>Growing local market demand</p> <ul style="list-style-type: none"> o Low local competition o Legislations and standards will increase consumption o Opportunity for import substitution <p>High export potential</p> <ul style="list-style-type: none"> o High demand in neighboring regions o Government strategy to increase export o Lack of regional competition <p>High potentials for industry growth</p> <ul style="list-style-type: none"> o High profit margins o Protected local industry o Qualifying programs for small investors o Success stories will encourage investors o Cost advantage <p>Potential foreign investment</p> <ul style="list-style-type: none"> o New industrial areas o USA-China trade war o New Chinese investments o Low exchange rate 	<p>Increasing competition</p> <ul style="list-style-type: none"> o From other outsourcing countries o From China and India in local market o From local small companies o From foreign investments o From conventional textile materials o From Turkey in export to EU <p>Changes in the business environment</p> <ul style="list-style-type: none"> o Political instability in the region o Increase in utilities and energy prices o Instability in investment laws o Export and import control on high-performance materials o Unstable bank interest rate o Appreciation of rupee against US\$ for exporters o Removal of local import tariffs o Removal of local export subsidy o Changes in the trade agreements <p>Technological changes</p> <ul style="list-style-type: none"> o Fast technological changes o Increase in proprietary technology

Not only is there potential in the local marketplace, but there is potential in export market as well. There is a growing demand in the regions such as Gulf countries and African countries and there are government incentives to increase exports.

3.6 Recommendations

3.6.1 Required interventions

Table 33: Required interventions for technical textiles value chain in Pakistan

#	Constraints and bottlenecks	Required intervention	Responsible entity/ association
Low technical expertise and lack of proprietary technology			
1.1	Lack of technical know-how	Establishment of specialized centers of excellence and competitive centers, which can support in technical training, technical consultation, and technology transfer.	<ul style="list-style-type: none"> Ministry of Commerce/Ministry of Federal Education Higher Education Commission of Pakistan
1.2	No proprietary technology, since most of the companies in Pakistan rely on machinery manufacturers in providing the technical know-how	Establishment of specialized research centre and technology incubator, which can support all research and development activities as well as technology commercialization.	<ul style="list-style-type: none"> Ministry of Commerce Higher Education Commission of Pakistan Ministry of Federal Education
1.3	There is a lack of specialized education in technical textiles and nonwovens and accordingly lack of experts who can provide technical support to the companies.	<ul style="list-style-type: none"> Update the curriculum of the textiles engineering departments to include a major or concentration on technical textiles. Add special topics on technical textiles in the curriculum of other engineering majors. 	<ul style="list-style-type: none"> National Textile University (NTU) Textile Department in universities Pakistan Engineering Council
1.4	There is a general lack of awareness on technical textile materials, applications, and benefits	Providing awareness and training programs to the textiles' companies in Pakistan on the fundamentals, applications, and market potential of technical textiles.	<ul style="list-style-type: none"> APTMA and other associations Chambers of Commerce and Industry WWF

1.5	There is a lack of technical labour with the desired expertise and skills set	Establishment of vocational training programs, as well as professional educational programs to industry professional in major technical textiles sectors in Pakistan.	<ul style="list-style-type: none"> • NAVTEC • TEVTA • WWF
1.6	Limited design or development capabilities	Establishment of pilot plants and prototyping facilities, to support scaling up of new technical textile developments	National Textile University (NTU)
Lack of suppliers of high-performance and specialized fibers, yarns, and fabrics			
2.1	Unavailability of high-performance and specialized raw materials such as, carbon fiber, and aramid fiber, which are key components in a wide range of technical textiles applications, especially protech	<ul style="list-style-type: none"> • Create a supply chain training with an emphasis on technical textiles and major global suppliers. • Facilitate the importation of high-performance and specialized fibers, yarns and fabrics. • Reduce the import tariffs on technical textiles raw materials. 	<ul style="list-style-type: none"> • Ministry of Commerce, • FBR

There is a need to establish specialized centers of excellence and competitive centers, which can support technical training, technical consultation and technology transfer.

3.7 Regional and international success stories

The shifting from traditional textiles into technical textiles has been the objective of several countries throughout the world. India is seen as one of the major players in the global textile value chain. The Indian government introduced the Scheme for Growth and Development of Technical Textiles (SGDTT) in 2008 with a US\$6.41 million fund. It consisted of three main elements:

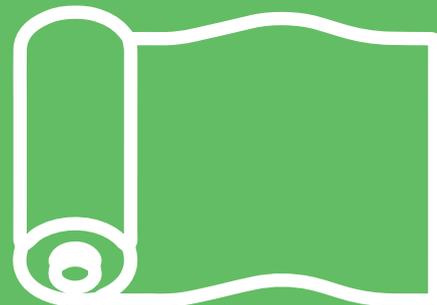
1. Baseline survey,
2. Awareness-raising and
3. Setting up centres of excellence for technical textiles.



The baseline survey was carried out to create an accurate and detailed data base of statistics and information on the technical textile sector in India. Outreach campaigns included more than 60 outreach programmes, seminars and workshops throughout India.

In addition to this, four centers of excellence in four sub-sectors were established as well.

1. Bombay Textile Research Association - BTRA (geotech),
2. Synthetic and Art Silk Mills' Research Association - SASMIRA (agrotech),
3. Northern India Textile Research Association - NITRA (protech), and
4. South India Textile Research Association - SITRA (medtech)



These centers of excellence provide support to the industry for testing, training, information, and other services under the same roof.

In addition to the three main components of the programme, the country also organized two technological missions on technical textiles (TMTT) between 2010 and 2015, which were extended by two additional years between 2017 with US\$2.77 million in funding. The first mission focused on standardization, the establishment of common test facilities with national/international accreditation, the establishment of local prototyping facilities and training facilities.

On the basis of the initial mission, four additional centres of excellence were established in the areas of:

1. Nonwovens
2. Composites
3. Indutech and
4. Sportech

Whereas the second mission focused on support for the domestic and export markets of technical textiles, including support for the start-up of undertakings and the financing of workshops, social compliance and market support, entering into R and D contracts and establishing focused incubation centers.

In addition, the country promotes the use of agrotech and geotech by raising awareness, establishing demonstration centres and capacity building. Moreover, India has included all technical textile machinery under the Technology Upgrade Funds Scheme (TUFFS), which provides a 10 per cent capital subsidy and a 5 per cent interest repayment, in addition to a 5 per cent preferential tariff on machinery.

On the infrastructure front, the country has implemented the Scheme for Integrated Textile Parks Programme (SITP), which provides the industry with world-class infrastructure to create textile units. Through this program, the government of India supports businesses in the creation of their business infrastructure in parks to a maximum of 40 per cent of the project cost limited to INR 40 crores (US\$5.3 million) for each textile park.

India has also launched a project to strengthen the database and standards for technical textiles to support decision-making by the government and other industry stakeholders. This project included the completion of a baseline survey on strengthening the technical textiles industry database, as well as the identification and classification of technical textiles HS codes.

The Indian model of growth in the technical textiles sector has been a great success. The technical textiles sector in India has become one of the fastest growing segments of the Indian economy and should see double-digit growth in the coming years. It is expected to reach a market size of US\$27.7 billion by 2021. In addition, the Indian industry has now grown to 2,100 producers of technical textiles, with a 5 per cent share of the global market for technical textiles. The success of India has attracted many international technical textile actors to invest in India, like Johnson and Johnson, P&G, 3M, DuPont, Freudenberg, Teijin, Ahlstrom, Owens Corning, among others.

The technical textiles sector in India has become one of the fastest growing segments of the Indian economy and should see double-digit growth in the coming years.

3.8 Proposed technical assistance interventions in future

Following interventions are proposed in alignment with key stakeholders that will support existing SMEs integration into the technical textiles value chain:

1. Train and raise the awareness of customs' employees on identification and classification of technical textiles raw materials and end-products according to HS codes to increase the accuracy of foreign trade data.
2. Perform feasibility studies for the suggested opportunities for imports substitution, especially those opportunities suitable for SMEs.
3. Development of national data base of technical textiles manufacturers.
4. Support the national incubator specializing in the textile industry at National Textile University, Faisalabad for start-ups on technical textiles.
5. Support the textile institutes especially National Textile University (NTU) for capacity building and knowledge transfer for cluster design, new manufacturing technologies, and new material applications to ensure a sustainable, low-cost knowledge transfer, continuous improvement, and growth of SMEs.
6. Provide training and awareness programs to the textile companies and SMEs in Pakistan on the fundamentals, applications, and market potential of technical textiles.

References

- [1] Midani M, Hassanin A. Technical Textiles Value Chain Gap Analysis in Egypt. 2019. Epub ahead of print 2019. DOI: 10.13140/RG.2.2.22344.26887.
- [2] <https://comtrade.un.org/data>. 2020. Collected and presented by Tanveer Hussain, National Textile University
- [3] Yu C. Natural Textile Fibres: Vegetable Fibres. *Text Fash Mater Des Technol* 2015; 29–56.
- [4] Shuli F, Jarwar AH, Wang X, et al. Overview of the Cotton in Pakistan and its Future Prospects. *Pakistan J Agric Res*; 31. Epub ahead of print 2018. DOI: 10.17582/journal.pjar/2018/31.4.396.407.
- [5] Statista. 2020.
- [6] Mohammed L, Ansari MNM, Pua G, Jawaid M, Islam MS. A Review on Natural Fiber Reinforced Polymer Composite and Its Applications. *Int J Polym Sci*. 2015;2015.
- [7] Ramamoorthy SK, Skrifvars M, Persson A. A review of natural fibers used in biocomposites: Plant, animal and regenerated cellulose fibers. *Polym Rev*. 2015;55(1):107–62.
- [8] Shirai H. Natural Fibers. *Sen'i Gakkaishi*. 2003;59(6):1–23.
- [9] Naveen J, Jawaid M, Amuthakkannan P, Chandrasekar M. Mechanical and physical properties of sisal and hybrid sisal fiber-reinforced polymer composites. *Mechanical and Physical Testing of Biocomposites, Fibre-Reinforced Composites and Hybrid Composites*. Elsevier Ltd; 2019. 427–440 p.
- [10] Tholkappiyan E. A Preliminary Study for Improving the Banana Fibre Fineness using Various Chemical Treatments. *Glob J Res Eng*. 2017;16(3):17–22.
- [11] Rawal A, Anandjiwala R. Comparative study between needlepunched nonwoven geotextile structures made from flax and polyester fibres. 2007;25:61–5.
- [12] Dai XQ. *Fibers. Biomech Eng Text Cloth*. 2006;163–77.
- [13] <http://www.pjma.com.pk/>. 2020.
- [14] <https://www.trademap.org/>. 2020.
- [15] <http://www.pacra.com.pk/pages/research>. 2020.
- [16] <https://www.tco.com.pk/publications.aspx>. 2020.
- [17] <http://www.prgmea.org/>. 2020.
- [18] <https://exportpotential.intracen.org/>. 2020.
- [19] Rigby, A. J., Anand SC. *Handbook of Technical Textiles*. Woodhead Publ." Ltd., England; 2000 p.
- [20] Sanjay Arora AS& SJ. *India: An emerging market & global manufacturing hub for technical textiles*. 2018.
- [21] *Future Market Insights (FMI)*. 2017.
- [22] Noor Ahmed Memon. *Innovations in intelligent apparel and technical textiles*. *Pakistan Text J*. 2010;(July).
- [23] Djafari Petroudy SR. *Physical and mechanical properties of natural fibers. Advanced High Strength Natural Fibre Composites in Construction*. Elsevier Ltd; 2016. 59–83 p.
- [24] *Textile Policy 2009-14*. 2009.
- [25] *Textile Policy 2014-19*. 2014.

^[26] Sheraz A, Abher R, Nawab Y. *Fibers for Technical Textiles*. Sheraz Ahmad, Abher Rasheed YN, editor. Springer Nature Switzerland; 2020.

Technical textile products are used primarily for their technical performance and functional properties. The share of technical textiles in Pakistan's export is about 0.3 per cent against 2.4 per cent share in export of conventional textiles.

Pakistan has an untapped export potential of US\$12.2 billion out of which potential of textile and clothing is about US\$7.0 billion.



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The technical textile industry is one of the fastest growing industries in the world with an emerging market of US\$200 billion

Pakistan is not exploiting markets like Japan, Russia, Korea, Mexico, Switzerland etc. which are importing more than US\$100 billion worth of textiles and clothing.



Why we are here:

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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