

## An Analysis of India-SAARC Trade in Pharmaceuticals with Special Emphasis on the COVID-19 Pandemic

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### Abstract

*This study attempts to explore the prospects of India's pharmaceutical trading relationship with other South Asian nations in the light of some select trade indexes. To this end, the study makes use of secondary data retrieved from the UN Comtrade database for a period of 15 years from 2007 to 2021. An analysis of the trade intensity index brings out that India has an intense pharmaceutical trade relationship with Nepal and Sri Lanka, suggesting the possibility of future integration. However, India's pharmaceutical trade is found to be lesser than expected with respect to Bangladesh and Pakistan, underlining that there is a significant gap to be filled and enormous potential to be realized. From the computation of revealed comparative advantage, it is found that, with the exception of India, no other South Asian nations has a comparative advantage in pharmaceuticals. Further, the analysis of trade complementarity index reveals a fair degree of complementarity among SAARC nations in trading pharmaceuticals, necessitating expanded trade to capitalize on this complementarity. This study also sheds light on the role of India's pharmaceutical industry in ensuring critical healthcare supplies in South Asia during the COVID-19 pandemic.*

**Keywords:** Pharmaceuticals; Trade Intensity Index; RCA Index; Trade Complementarity Index; SAARC Countries; COVID-19; Vaccine Maitri.

**JEL Classification:** F10; F14; R19

### Introduction

It is now well recognized that regional integration and free trade agreements play an important role in the process of economic development. Countries across the world have embraced regional integration as a means of accelerating their own economic development and elevating living standards through liberalizing their respective economies. Empirical literature suggests that economic integration and regional trade affect a country's economic growth and well-being favourably (Heng and Gayathri, 2004; Dennis, 2006; Ma, 2022). Evidence also shows that small countries gain more from trade liberalization with large countries (Alesina et al., 2005; Ahmed and Batool, 2017). Numerous researches have also examined the advantages of expanding bilateral trade between India and its neighbouring countries (Qamar, 2005; Sikdar, 2006; Pitigala, 2005; Hussain, 2011; Taneja et al., 2013; Raghurampatruni et al., 2021). The SAARC (South Asian Association for Regional Cooperation) has been formed in 1985 based on the initiative of Bangladesh. It is an association of eight nations, including India, Bhutan, Bangladesh, Pakistan, Nepal, Sri Lanka, the Maldives and Afghanistan (Afghanistan joined SAARC later in 2007). It seeks to foster peace, healthy neighbourly relations and purposeful cooperation among member nations of the region. Following the establishment of SAARC, member nations have signed an agreement known as SAPTA (SAARC Preferential Trading Agreement) in 1993, which has later been transformed into SAFTA (South Asian Free Trade

Area) in 2006 to facilitate greater regional economic and trade integration. India accounts for roughly 90 percent of the regional trade with Sri Lanka, Nepal and Bangladesh (Taneja et al., 2013). India is, therefore, the most significant player in South Asian trade integration. Both bilaterally and through SAFTA, India has taken a number of initiatives to strengthen its trade ties with neighbouring countries. Given the increasing importance of pharmaceutical sector in the global trade, it is one such area where South Asian countries can integrate and strengthen their regional trade cooperation. The global pharmaceutical market is estimated at US\$ 1423.5 billion in 2021, and it is anticipated to expand at a rate of 8.5 percent per year from 2021 and touch US\$ 1738.2 billion by 2023 (Business Research Company, 2020). This sector assumes significance because it is directly associated with human health and well-being. Its significance also emanates from the goal of protecting lives and improving healthcare services. The pharmaceutical sector is considered as the cornerstone of any country's public healthcare system (Pant and Pande, 2017). India's pharmaceutical sector has emerged as one of the most technologically advanced and dynamic segments of Indian manufacturing. It has attained a significant scale in developing cost-effective modern drugs on its own to emerge as "the pharmacy of the world". About 95 percent of India's pharmaceutical requirements are met by this industry (Das and Das, 2015). The industry has made important contributions to the country's economic growth over the years. It employs more than 2.7 million people in different areas of drug manufacturing and research and development, either directly or indirectly (Department of Pharmaceuticals, 2020). The industry has recorded a CAGR of 6.6 percent during 2015-2019 and touched US\$ 20 billion in 2019 (FICCI, 2022). It has experienced a downturn at the advent of COVID-19, but reverted quickly and has been growing rapidly since early 2021. It is anticipated to expand at a rate of 12.3 percent per year during the period 2020-2030, and will touch the value of US\$ 120 billion by 2030 (IBEF, 2022). The industry has been successful not only in catering domestic pharmaceutical requirements, but also become the largest exporter of generic medicine globally. The Indian pharmaceutical sector manufactures around 60000 distinct generic brands throughout 60 therapeutic areas, accounting for 20 percent of global generic drug supply (Department of Pharmaceuticals, 2021). Pharmaceutical exports from India have grown by 18.2 percent over the previous year in FY2021, the highest growth in exports during the last eight years (FICCI, 2022). The value of India's pharmaceutical exports has amplified from 4476.7 million in 2007 to 21011.6 million in 2021. During the same period, India's share of world pharma exports has also risen from 1.22 percent to 2.92 (UN Comtrade, 2022). India's pharmaceutical industry exports pharmaceuticals to over 200 countries, with the United States being the largest export destination (Hoque and Das, 2021). India's top five pharma export destinations in 2020-21 are the United States (31.57 percent), South Africa (3.41 percent), the United Kingdom (2.93 percent), Russia (2.41 percent) and Germany (2.36 percent). During 2020-21, drug formulations and biologicals account for 77.02 percent of India's pharmaceutical exports, followed by bulk drugs and drug intermediaries (18 percent), surgical (2.77 percent), and Ayush and Herbals (2.21 percent) [Pharmexcil, 2020].

The present research analyzes the trends and prospects of pharmaceutical trade between India and other South Asian nations and the possibilities for future expansion. Specifically, the study seeks to address the following objectives

- To access the prospects of India's pharmaceutical trading relationship with South Asian nations.
- To evaluate the role that India's pharmaceutical sector played in maintaining crucial medical supplies in South Asia during the COVID-19 pandemic.

## Literature Review

The topic of intra-SAARC trade, as well as India's trade ties with other SAARC economies have been the subject of numerous academic studies. Pitigala (2005) has found that despite the advantages of increasing intra-regional trade, its rapid expansion in South Asia is rather difficult due to weak trading ties between SAARC members. Baysan et al. (2006) also asserted that the policy prescriptions for SAFTA are on the weaker end of the spectrum. This region ranks low in GDP, income per capita, and share of world trade. Consequently, trade preferences for member countries are more likely to divert trade rather than create it. Katti (2007) argues that in order to improve their competitive position and attract foreign private capital for expanding and diversifying their production base, it is crucial for SAARC nations to enhance regional cooperation through FTAs and customs unions. Rahman (2008) analyses the macroeconomic characteristics of SAARC nations and the potential for increased trade between them. According to Kumar and Singh (2009), the progress of South Asian regional integration has fallen significantly short of its potential. The authors contend that due to its dominant size, human resources, and aspirations for a global role, India will need to assume a disproportionately greater responsibility for fostering regional cooperation in South Asia. Raghurampatruni (2011) investigates the patterns of trade within the SAARC region and finds that, despite the formation of SAFTA, intra-SAARC trade accounts for only 4.8 percent of overall South Asia's trade, as against 25.8 percent for ASEAN members. Regional integration in South Asia is low and barriers to trade are considerable, as stated by Madhusoodanan (2010). Despite a recent uptick, the region's trade share is still far lesser than that of other regional trading blocs. Taneja et al. (2013) have found that South Asian regional trade remains very low at around 5 percent of the overall, while India imports less than one percent of its total from South Asia. Numerous trade-facilitating initiatives have not been implemented in the region, the research claims, due to factors such as the high transaction costs associated with transporting commodities across borders and the tense India-Pakistan relations. South Asian intra-regional commerce will increase if tariff and non-tariff obstacles are lowered (Moinuddin, 2013). Chaturvedi et al (2015) argue that there exists significant potential for greater economic integration in the South Asian region. Nevertheless, the lack of basic transport-transit connectivity, technical harmonization, and the presence of non-tariff barriers all contribute to increased trade expenses and hinder legal trade. Sharma (2021) investigates the trend in India's trade with South Asian countries during the COVID-19 pandemic and finds that the pandemic has led to a significant increase in India's trade with these countries. Similarly, Suhail et al. (2022) examine the impact of COVID-19 on India's trade with South Asian countries and observe that the pandemic has helped boost India's exports to these countries.

Another strands of literature investigated the potential for India-SAARC trade by utilizing the gravity model framework. Rahman et al. (2006) have investigated the effectiveness of SAPTA along with nine other regional trade agreements (RTAs) and found that SAPTA made a substantial contribution to the regional expansion of trade. Kaur and Nanda (2010) employ a gravity model to assess India's potential for exports to other SAARC members during 1981-2005, and they conclude that Pakistan, the Maldives, Nepal and Bhutan are among the member nations where India has a significant export potential. Akram and Mahmood (2012) evaluate country-specific and industry-specific determinants of intra-industry trade of Pakistan and other SAARC nations by utilizing panel data gravity model approach. The study finds that country-specific variables are more important in explaining intra-industry trade than industry-specific variables. Kumar and Ahmed (2015) explore the potential determinants of trade in South Asia and find that, while population and GDP exercise a favourable effect on trade, distance and tariffs have a detrimental effect. The research also finds that SAFTA has a trade

creating effect on its member nations. Manocha (2018) examines the impact of SAARC trading bloc on India's trade potential by utilizing an augmented gravity model over the period 1991–2016. The analysis reveals that the GDP of the trading partners and liberal trade policies are significant determinants of India's trade. Furthermore, it has been observed that India's imports from SAARC nations have experienced a substantial decline over time, while India's intra-SAARC exports have been steadily increasing. Kumar (2020) examines the potential spillovers of India's trade with South Asian countries by utilizing autoregressive distributed lag (ARDL) model during the period 1990–2016. The study results indicate that the economic growth and regional trade of India have significant short and long run spillovers on the economic growth of Bangladesh, Sri Lanka, Nepal and Bhutan. The study emphasizes that India has the potential to serve as a catalyst for economic development and can play a crucial role in advancing the objectives of SAARC through political and diplomatic interactions.

Numerous studies have also investigated intra-industry trade, trade intensity, and comparative advantage of India and other SAARC states utilizing specific trade indicators (Sharma and Kumar, 2012; Kumar and Ahmed, 2014; Islam, 2018; Jain and Singh, 2009; Sharma, 2013; Ahmad et al., 2017; Raghurampatruni et al., 2021). Kumar and Ahmed (2014) investigate India-Bangladesh intra-industry trade during the period 1975-2010 by using Grubel-Lloyd index at three-digit level of SITC. The study also calculated the trade complementarity, and RCA indices. The study results indicate that the extent of intra-industry trade is high in sectors like crude materials, inedible, except fuels, food and live animals. Computation of TCI reveals mismatch between Bangladesh exports and Indian imports. In light of comparative advantage, the study concludes that Bangladesh should diversify its export structure to reduce trade deficit with India. Islam (2018) evaluates the inter-and intra-industry trade relationship between India and Bangladesh and finds that India has a much stronger relative position in the global trade vis-à-vis Bangladesh. It is also found that India dominates Bangladesh in bilateral trade, resulting in a very large and persistent trade deficit of Bangladesh with India. At the disaggregated level, the study finds that India has a comparative advantage in more products than Bangladesh and the degree of intra-industry trade is almost negligible between the two nations. Raghurampatruni et al. (2021) examines the opportunities and trade potential between India and other SAARC countries by utilizing a variety of trade indices like of export intensity index and import intensity index, the RCA index and RID index. The study finds an increasing export intensity and import intensity of trade between India and other SAARC countries. It also highlights a significant trade potential between these nations and the untapped trade and investment scenario that may be harnessed by enhancing the regional alliance of SAARC.

This study extends the available literature in the following respects. First, from the foregoing review it is observed that while numerous researches have examined India-SAARC trade dynamics, very little attention has been paid to analyze the prospects of India's trading relationship with other SAARC members in the context of an emergent sector like pharmaceuticals. Pant and Pande (2017) and Ahmed and Batool (2017) confined their analysis to India-Pakistan pharmaceutical trade only. The present research, thus, adds to the limited literature in this direction. Second, this study examines the competitiveness and complementarity in pharmaceutical trade between India and other SAARC nations by calculating the RCA and trade complementarity indexes. Third, our study also explores the possibility of regional integration in South Asia from a COVID-19 perspective.

## **Data and Methodology**

### ***Data Source***

This study is based on secondary data, collected from the UN Comtrade database for the period 2007-2021. The data have been extracted for the two basic groups of pharmaceutical products,

namely drug formulations (SITC Code 542, Revision 3), and bulk drugs and intermediaries (SITC Code 541). This study also uses data from different secondary sources like annual reports, news papers and so on, wherever necessary.

### **Methodology**

In order to evaluate the prospects of India's pharmaceutical trade relation with SAARC nations, the Trade Intensity Index (TII), the Trade Complementarity Index (TCI) and the Revealed Comparative Advantage (RCA) Index have been used. These indexes are briefly discussed below

#### **Trade Intensity Index (TII)**

The TII measures the intimacy of a country's trading relationship with another (Goyal and Vajid, 2018). Based on the relative importance of the two nations involved in international trade, the TII determines whether the value of their trade is smaller or greater than expected (World Integrated Trade Solution, 2010). TII is of two types, viz. Import Intensity Index (III) and Export Intensity Index (EII). Following Kojima (1964) and Srivastava and Green (1986), these indexes are stated as follows

$$XII_{ijk}^{(t)} = \frac{x_{ijk}^{(t)} / X_{ik}^{(t)}}{M_{jk}^{(t)} / (M_{wk}^{(t)} - M_{ik}^{(t)})} \dots (1); \text{ and}$$

$$MII_{ijk}^{(t)} = \frac{m_{ijk}^{(t)} / M_{ik}^{(t)}}{X_{jk}^{(t)} / (X_{wk}^{(t)} - X_{ik}^{(t)})} \dots (2)$$

In equations (1) and (2),  $XII_{ijk}^{(t)}$  represents the export intensity index of country i's trade in product k (pharmaceuticals) with partner j at t-th time and  $MII_{ijk}^{(t)}$  is the import intensity index of i's trade in product k with country j.  $x_{ijk}^{(t)}$  stands for country i's export of k-th product to partner j and  $X_{ik}^{(t)}$  is i's total exports of product k.  $M_{jk}^{(t)}$  indicates j's total imports of k-th product,  $M_{wk}^{(t)}$  is total imports of k<sup>th</sup> product by the world and  $M_{ik}^{(t)}$  is the total imports of product k by the country i. Similarly,  $m_{ijk}^{(t)}$ ,  $X_{jk}^{(t)}$  and  $X_{wk}^{(t)}$  respectively denote i's imports of k-th product from j, j's total exports of k-th product and world's total exports of product k. A value of TII smaller (greater) than one implies a smaller (larger) than expected bilateral trade between two partners.

#### **Revealed Comparative Advantage (RCA) Index**

The index of RCA, developed by Balassa (1965), is the most frequently used measure of a country's comparative advantage. Several studies have applied this index to ascertain a country's comparative trade performance relating to a particular commodity/sector (Pitigala, 2005; Banik and Kim, 2020; Ahmad et al., 2017; Ahmed et al., 2020). The index of RCA for country i for k-th product (pharmaceuticals) in the t-year can be expressed as

$$RCA_{ij}^{(t)} = \left[ \left( \frac{x_{ik}^{(t)}}{X_i^{(t)}} \right) / \left( \frac{x_{wk}^{(t)}}{X_w^{(t)}} \right) \right] \dots (3)$$

In equation (3),  $x_{ik}^{(t)}$  denotes the value of export of k-th product by the i-th country in the t-year and  $X_i^{(t)}$  represents total exports of all commodities by the i-th country in the t-year. Similarly,  $x_{wk}^{(t)}$  represents the export value of k-th product by all countries in the time t and  $X_w^{(t)}$  indicates the value of export of all products by all countries in the t-year. The range of value of the index of RCA is  $0 \leq RCA \leq \infty$ . A country has a comparative advantage in the export of product k if the value of RCA is higher than unity. The index of RCA, thus, determines a country's strong/weak export sectors.

**Trade Complementarity Index (TCI)**

The TCI has been developed by Michaely (1996) which assesses the degree to which two countries are 'natural trading partners'. The TCI determines the adequacy of export supply by country *i* with country *j*'s import demand (Sikdar, 2006; Vahalik, 2014). In this study, the TCI is estimated as the arithmetic mean of the coefficient of specialization (CS) and the coefficient of consistency (CC) using the methodology followed by Xu (2017), Li (2018) and Chen et al. (2020), and is given by the following equations

$$CS = 1 - \frac{1}{2} \sum_k |x_{ik}^{(t)} - m_{jk}^{(t)}| \dots (4)$$

$$CC = \frac{\sum_k x_{ik}^{(t)} m_{jk}^{(t)}}{\sqrt{\sum_k (x_{ik}^{(t)})^2 \sum_k (m_{jk}^{(t)})^2}} \dots (5)$$

$$TCI_{ij}^{(t)} = \frac{1}{2} (CS + CC) \dots (6)$$

Where  $TCI_{ij}^{(t)}$  refers to the trade complementary index between country *i* and *j* at time *t*.  $x_{ik}^{(t)}$  is the share of exports of *k*-th product (bulk drugs/formulations) by country *i* in its total pharma exports in the *t*-year, and  $m_{jk}^{(t)}$  represents the share of imports of *k*-th product by country *j* in its total pharma imports in the *t*-year. The TCI value ranges between  $0 \leq TCI \leq 1$ . When the index value is closer to one, there will be stronger trade complementarity and more opportunities for trade cooperation between two countries (Li, 2018). When the value of TCI is smaller and closer to zero, there will be lower degrees of complementarity between the two trading partners.

**Results and Analysis****India's Pharmaceutical Trade with SAARC Nations**

India's pharmaceutical trade with SAARC nations has remained very low over the years. These countries account for a negligible share in India's pharmaceutical exports and imports. As per WITS data, India's total pharmaceutical trade with SAARC stands at US\$1059.4 million out of a total of US\$26576.3 million in 2021, which accounts for 3.99 percent of its global pharmaceutical trade. India maintains a positive trade balance with all SAARC nations, possibly because their pharmaceutical industries are still in their infancy. Table 1 presents the trends in pharmaceutical exports from India to SAARC during 2007-2021. India's pharmaceutical exports to SAARC have increased over four-fold from US\$246.39 million in 2007 to US\$1043.42 million in 2021, registering an average growth of 11.6 percent per year over the last 15 years. India's exports of pharmaceuticals to SAARC has remained below 6 percent of its total pharma exports throughout the years and it has exhibited a somewhat declining trend. It has fallen from 5.5 percent in 2007 to 4.97 percent in 2021. On examining the patterns of bilateral trade, it is observed that, over the years, Sri Lanka has been India's top export market for pharmaceutical products, with an average share of 1.39 percent. From a level of US\$80.69 million in 2007, India's pharmaceutical export to Sri Lanka has increased almost three-fold to US\$227.52 million in 2021. Pharmaceuticals Export Promotion Council [Pharmexcil] (2018) has reported that Sri Lanka imports approximately 90 percent of its medicinal requirements from different sources, with India accounts for 49 percent, followed by Pakistan (8 percent), and the USA (3 percent). India's second largest export partner in South Asia is Nepal, accounting for 1.18 percent of overall pharmaceutical exports, followed by Bangladesh (0.75 percent). Barring a few years, India's pharma exports to both Nepal and

Bangladesh have shown an increasing trend over the years. On the import side, India is the single largest and second largest import partner of Nepal and Bangladesh, accounting for approximately 80 percent and 12 percent of their total pharmaceutical imports, respectively (Pharmexcil, 2020). Pharmaceutical exports from India to other SAARC countries such as Afghanistan, Pakistan, the Maldives and Bhutan have remained negligible during the last 15 years. Surprisingly, Pakistan, the second largest South Asian economy, accounts for barely 0.50 percent of India's pharmaceutical exports. As per the UN Comtrade data, Pakistan has imported a major chunk of its pharmaceutical requirements from Switzerland and Germany, which respectively account for 12.67 percent and 10.44 percent of its overall pharmaceutical imports in 2020. Qamar (2005) and Chatterjee and George (2013) have opined that if Pakistan imports its medicinal needs from India rather than sourcing from other countries, it could save between US\$400 and US\$900 million on imports.

**Table 1.** India's Pharmaceutical Exports to SAARC Nations

(Value in US\$ Million; Share in %)

Year	AFG	BAN	BHU	MAL	NEP	PAK	SLK	Total Exports to SAARC	Share in SAARC Export
2007	39.73	36.75	0.14	3.99	63.40	21.69	80.69	246.39	5.50
2008	56.82	46.99	1.60	6.19	67.71	31.65	95.29	306.24 (24.3)	5.26
2009	51.45	47.94	0.76	5.85	69.73	31.70	95.94	303.37 (-0.9)	5.12
2010	30.79	54.16	0.37	6.00	71.65	29.24	119.48	311.70 (2.7)	4.38
2011	54.18	65.17	0.28	6.20	109.12	45.95	134.85	415.75 (33.4)	4.38
2012	40.39	74.15	0.90	6.67	110.95	40.69	146.95	420.70 (1.2)	3.87
2013	55.07	112.59	0.61	7.52	136.75	54.12	170.50	537.17 (27.7)	4.08
2014	46.62	83.84	0.49	9.28	147.92	63.16	153.99	505.30 (-5.9)	3.91
2015	46.13	79.72	2.02	10.46	133.31	47.78	187.58	506.98 (0.3)	3.65
2016	66.36	95.47	1.72	10.31	192.33	63.64	202.48	632.29 (24.7)	4.39
2017	80.39	87.41	2.47	13.28	197.76	79.50	200.67	661.47 (4.6)	4.63
2018	84.84	111.34	4.21	15.97	212.21	89.85	199.27	717.26 (8.4)	4.55
2019	76.87	167.53	6.02	19.15	222.03	83.06	202.45	777.11 (8.3)	4.35
2020	85.31	138.80	4.40	24.96	192.72	83.60	248.70	778.48 (0.2)	3.89
2021	65.63	218.64	8.59	25.98	285.96	211.10	227.52	1043.42 (34)	4.97
Average Share	0.53	0.75	0.02	0.09	1.18	0.50	1.39	4.46 (11.6)	4.46

Source: Authors' estimation based on UN Comtrade database

Note: Growth rates (%) of India's total pharma exports to SAARC are reported in the parentheses

Table 2 shows the trends in India's imports of pharmaceuticals from SAARC nations during 2007-2021. The figures in the table are given in the smallest possible denomination (US\$ Thousands) to clearly elucidate the trade patterns among the SAARC countries. Table 2 clearly shows that India's dependency on imports from SAARC countries has been quite negligible as far as pharmaceuticals are concerned. Pharmaceutical imports from SAARC countries to India have increased from US\$5732.3 thousands in 2007 to US\$15994.7 thousands in 2021, registering an average growth of 10.9 percent per year during a 15-year period. India's pharma imports from SAARC has ranged between just 0.21 and 0.39 percent of its overall pharma imports during the same period. Among the SAARC nations, though Nepal is the largest importing partner of India, it accounts for merely 0.25 percent (on average) of India's overall pharma imports. Sri Lanka and Bangladesh follow Nepal with an average share of only 0.02 and 0.002 percent, respectively.

**Table 2.** India's Pharmaceutical Imports from SAARC Nations

(Value in Thousand US\$; Share in %)

Year	AFG	BAN	MAL	NEP	PAK	SLK	Total Import from SAARC	Share in SAARC Import
2007	NA	NA	NA	5509.0	10.0	213.2	5732.3	0.35
2008	NA	0.8	0.1	4445.0	1.3	187.2	4634.3 (-19.2)	0.25
2009	1.8	0.03	0.05	4573.5	12.1	261.5	4849.1(4.6)	0.24
2010	NA	17.3	0.1	5163.6	17.9	154.8	5353.6 (10.4)	0.22
2011	11.4	80.8	NA	9486.9	99.2	1050.1	10728.4 (100.4)	0.39
2012	9.0	26.2	38.0	8674.7	72.3	1042.2	9862.3 (-8.1)	0.32
2013	2.4	2.7	10.4	8448.6	5.3	340.0	8809.3(-10.7)	0.29
2014	1.7	11.1	NA	9168.3	6.4	456.2	9643.7 (9.5)	0.30
2015	NA	71.6	NA	7392.5	6.6	369.2	7839.9 (-18.7)	0.25
2016	NA	7.8	NA	6090.1	49.5	555.2	6702.5 (-14.5)	0.21
2017	NA	5.6	0.1	8261.9	59.4	566.6	8893.5 (32.7)	0.26
2018	NA	75.6	NA	6067.7	0.1	1392.7	8502.1 (-4.4)	0.21
2019	33.1	70.5	4.8	7465.3	47.9	3183.8	10805.5 (27.1)	0.24
2020	150.5	17.6	0.03	10595.5	41.3	2306.2	13069.9 (21.0)	0.29
2021	NA	544.0	NA	13667.2	34.6	1748.9	15994.7 (22.4)	0.29

Source: Authors' estimation based on UN Comtrade Database

Notes: NA- Data not available; Growth rates (%) of India's total pharma imports from SAARC are reported in the parentheses

From the analysis it is evident that notwithstanding the creation of regional trading bloc, India's pharmaceutical trade with SAARC nations still remains very negligible. This could be due to differences in their market sizes. The Maldives and Bhutan, for example, cannot be the key export markets for India's pharmaceuticals. Therefore, expecting more than a modest possibility in trade between a large country like India and smaller South Asian countries like Bhutan and the Maldives, will not be appropriate.

### ***India's COVID-19 Pharmaceutical Aid to SAARC Nations***

The novel coronavirus (COVID-19) pandemic has become a global health crisis with devastating consequences for human lives and economies. As of August 5, 2022, there have been 57,90,92,623 confirmed instances of COVID-19 with 64,07,556 deaths (WHO, 2022). Countries across the world were not ready for such a huge crisis as the pandemic. The South Asian (SAARC) countries are no exception. The region has been caught unaware by the pandemic. During this very difficult time, ensuring the supply of critical healthcare medicine has become a more pressing challenge for the South Asian countries where public health infrastructure is not adequate to care for those affected by the ongoing pandemic. In such circumstances, there has been an overwhelming consensus among the SAARC members for regional cooperation to assure the supply of essential medicines/vaccines and other medical instruments needed to address this pandemic. India, being the largest country of the region as well as 'the Pharmacy of the World', has taken the lead and supplied essential medicines (Hydroxychloroquine and Paracetamol), vaccine and other healthcare instruments to over 100 countries, focusing on those in its immediate neighbours in sprits of its 'First Responder to a Crisis' and 'Neighbourhood First Policy'. On March 25, 2020, Bangladesh has received the first consignment comprising of 15,000 head caps and 30,000 surgical masks as emergency medical assistance from India. India's second consignment containing 1,00,000 Hydroxychloroquine tablets and 50,000 surgical gloves has been handed over to Bangladesh on April 26, 2020. The third tranche of India's assistance containing 30,000 RT-PCR testing kits has been received by Bangladesh on May 6, 2020 (DD News, 2020, 6 May). Bangladesh has become the first country to receive RT-PCR testing kits assistance from India as part of the country's 'Neighbourhood First Policy'. The President of Afghanistan has also expressed his gratitude to India in a tweet on April 20, 2020, for providing 1,00,000 Paracetamol and 5,00,000 Hydroxychloroquine (ANI, 2020a, 20 April). During the pandemic, India has provided varied



and need-based assistance to Sri Lanka. On April 7, 2020, India has donated a consignment containing 10 tonnes of life-saving drugs to Sri Lanka (The Economic Times, 2020, 7 April). In April, 2020, another two consignments of medical gloves and medicines have been delivered. India has also supplied a fourth shipment of 12.5 tonnes of essential medications to Sri Lanka on May 8, 2020 (Air News, 2020, 8 May). On April 22, 2020, India has donated 8, 25,000 doses of life saving drugs including 2,50,000 Hydroxychloroquine and 3,20,000 Paracetamol to Nepal to aid the country's fight against the pandemic (The Kathmandu Post, 2020, 22 April). In the next month, the second consignment containing 28 ICU ventilators and 30,000 RT-PCR testing kits has been handed over to Nepal. As Part of its ongoing support, India has also handed over 2,000 vials of Remdesivir injections to Nepal on November 26, 2020 (ANI, 2020b, 26 November). On August 26, 2021, India has gifted a 960 Liters Per Minute (LPM) Oxygen Plant, capable of serving 200 patients simultaneously, to Nepal in an effort to assist the country combating the pandemic (Firstpost, 2020). In April, 2020, the Maldives has received the first consignment containing 5.5 tonnes of essential medicines from India. In the next month, the Indian Air Force has lifted a second consignment of 6.2 tonnes of medicines to Male as part of *Operation Sanjeevani*. In September, 2020, India has also provided US\$ 250 million financial assistance to the Maldives to help the country cope with the pandemic (The Hindu, 2020, 30 September). During the pandemic, India has also made it easier for Maldivian patients to travel to the country for emergency medical treatment. Except for the Maldives, no other country has been granted this privilege (ANI, 2022, 15 March). Bhutan has also received three consignments of life saving drugs, including 2,00,000 doses of Hydroxychloroquine, as humanitarian aid from India to combat the outbreak of the pandemic (Pattanaik, 2021). Table 3 provides a snapshot of the humanitarian aid that India has extended so far to South Asian countries during the COVID-19 crisis.

**Table 3.** A Snapshot of India's COVID-19 Medical Aid to SAARC Countries

<i>Sl.</i>	<i>Country</i>	<i>Time</i>	<i>Medical Assistance</i>
1.	Afghanistan	Apr. 2020	1,00,000 Paracetamol and 5,00,000 Hydroxychloroquine
2.	Bangladesh	Mar. 2020	30,000 surgical masks and 15,000 head covers
		Apr. 2020	1,00,000 Hydroxychloroquine and 50,000 surgical gloves
		May 2020	30,000 RT-PCR testing kits
3.	Bhutan	Apr. 2020	A consignment of essential medicines including Hydroxychloroquine and Paracetamol
4.	Nepal	Apr. 2020	8,25,000 doses of medicines comprising 2,50,000 Hydroxychloroquine and 3,20,000 Paracetamol
		May 2020	28 ICU ventilators and 30,000 RT-PCR testing kits
		Nov. 2020	2,000 vials of Remdesivir injections
		Apr. 2021	39 Ambulances equipped with emergency facilities
		Aug. 2021	A 960 Liters Per Minute (LPM) Medical Oxygen Plant
5.	Maldives	Apr. 2020	11.7 tonnes of life saving medicines
6.	Sri Lanka	Apr. 2020	10 tonnes of medicines and one consignment of latex gloves
		May 2020	12.5 tonnes of essential life saving medicines
		Aug. 2021	280 tonnes of medical grade Oxygen

Source: Authors' compilation from various newspapers, articles, reports etc.

### ***India's COVID-19 Vaccine Supply to SAARC Nations***

India is the largest producer of generic drugs globally and one of the major providers of low-cost vaccine to various countries across the world. The Serum Institute of India is the world's largest supplier of vaccine. It manufactures Covishield (AZD1222) vaccine in collaboration with the United Kingdom's AstraZeneca and the Oxford University. Other prominent Indian pharma majors engaged in the development of vaccine are Bharat Biotech (Covaxin [BBV152] & BBV154), Biological E Limited (JNJ-78436735 & Bio E COVID-19), Genova Biopharmaceuticals (HGCO19), Indian Immunologicals (SARS-Cov-2), Cadila Healthcare Limited (ZyCoV-D), Aurobindo Pharma (UB-612), Dr. Reddy's Laboratories (Sputnik V) and many others (Sharun and Dhama, 2021; Singh et al., 2022). Thus, India meets approximately 60 percent of the world's demand for various vaccines (IBEF, 2022). The country has the capability of manufacturing more than 3 billion doses of COVID-19 vaccine annually (Puranwala, 2020). On January 20, 2021, India has launched its "Vaccine Maitri" initiative to provide vaccine supplies to the needy countries in order to aid them fight against the pandemic. Under this initiative, India has committed to assist 101 countries worldwide, including those in its immediate neighbours. As per the "Neighbourhood First Policy", India has dispatched the first consignment of 0.15 million doses of Covishield vaccine to Bhutan on January 20, 2021 (Table 4). Thus, Bhutan has become the first South Asian country to receive COVID-19 vaccination (Covishield) gift from India (PMO India, 2021). Similarly, on the same day, India has donated another consignment comprising of 0.1 million doses of Covishield to the Maldives. In addition to the donated doses, India has also aided these countries in obtaining vaccine supply at reasonable prices from the Indian pharmaceutical companies. On the next day, India has sent another shipment of 2 million doses of Covishield vaccine to Bangladesh. India has made this donation to Bangladesh at a crucial moment when the COVID-19 cases have been rapidly increasing in this country. In late January, Nepal and Sri Lanka have also received one million and 0.5 million doses of Covishield vaccine, respectively, as gifts from India to aid in the fight against the COVID-19 pandemic. Table 4 clearly shows that the SAARC countries, barring Pakistan, continue to be India's top priority for COVID-19 vaccine supply and they together account for approximately 15 percent of India's total vaccine supply of about 239 million doses to 101 countries across the world. In February, India has sent a shipment of 0.5 million doses of Covishield vaccine to Afghanistan, a war-torn country. India has donated another consignment consisting of 0.5 million doses of Covaxin to Afghanistan on

December 31, 2021. Thus, as of December 31, 2021, India has donated an aggregate of 6.662 million doses of vaccine to SAARC nations as part of its 'Vaccine Maitri' initiative to help them in fighting the pandemic. In addition, India has supplied 17.6008 million doses of Covishield vaccine and 11.423 million doses of Covaxin to SAARC countries as commercial exports. Of the total commercial export supply to SAARC countries, Bangladesh has the largest share (66.47 percent), followed by Nepal (28.90 percent), Sri Lanka (2.63 percent), Afghanistan (1.61 percent) and the Maldives (0.39 percent). It is worth recalling here that Pakistan is the only country that has received COVID-19 vaccination from China rather than India. Being the world's vaccine manufacturing hub, India's contribution towards providing COVID-19 vaccine to SAARC countries will not only provide fair and equal access to vaccines but will also assist enhance its ties with its neighbours.

### ***India-SAARC Pharmaceutical Trade: Intensity, Comparative Advantage and Complementarity***

For an expected bilateral trade flow between country  $i$  and country  $j$ , the share of  $i$ 's export to  $j$  should at least be equal to the share of world exports going to  $j$ . Otherwise, it indicates that country  $i$  fails to exploit country  $j$ 's market and that there is a room for expanding country  $i$ 's exports to country  $j$ . Therefore, in order to determine whether India's pharmaceutical trade relation with other SAARC nation is smaller or larger than expected, export intensity index (EII) and import intensity index (III) are computed and the results are reported in Table 5. As stated earlier, a trade intensity index greater than one implies a greater than expected bilateral trade and vice versa. Table 5 depicts that India's export intensity is greater than one for all the South Asian nations considered here, indicating that India's pharma exports to these nations are more intensive and greater than the expected level. Export intensity of India is the highest for Nepal as compared to other SAARC countries; however, the index shows a fluctuating trend over the years. India's export intensity with Sri Lanka shows a continuous declining trend. Import intensity of India is well above the expected level for Nepal and Sri Lanka, implying that India has an intense import relationship with these two countries in pharmaceuticals. Import intensity is exceptionally high for Nepal with index value of 494.17 in 2009 which has, however, declined to 118.19 in 2019. Barring a few years, India's import intensity with Sri Lanka shows an overall rising trend, implying thereby a prospect for future bilateral cooperation. Import intensity of India with Bangladesh and Pakistan is smaller than unity throughout the years, implying that these countries are trading less than they should. This indicates an unintense presence of their pharma products in Indian market. There is, thus, a substantial room for pharmaceutical trade between these nations to expand. The South Asian countries, particularly Bangladesh and Pakistan, can enhance their pharmaceutical trade performance by focusing on increased trade with India.

**Table 4.** India's COVID-19 Vaccine Supply to SAARC Nations as of December, 2021 (in Million Doses)

Sl.	Country	Grants-in-Aid (Covishield/Covaxin)		Commercial (Covishield)		Commercial (Covaxin)				Total Supply
		Quantity	Date of Dispatch	Quantity	Date of Dispatch	Quantity	Date of Dispatch			
1.	Afghanistan	1	0.5 07-Feb-21			0.468	06-Mar-21			1.468
2.	Bangladesh	3.3	0.5 31-Dec-21	15.0008	5 25-Jan-21	4.292	0.212 04-Dec-21	0.792 14-Dec-21	3.288 06-Dec-21	22.5928
			1.2 26-Mar-21		2 22-Feb-21					
			0.1 02-Apr-21		1 09-Oct-21					
					4.5006 01-Dec-21 2.5002 07-Dec-21					
3.	Bhutan	0.55	0.15 20-Jan-21 0.4 21-Mar-21							0.55
4.	Maldives	0.2	0.1 20-Jan-21 0.1 19-Feb-21	0.1	19-Mar-21	0.012	06-Mar-21			0.312
5.	Nepal	1.112	1 21-Jan-21	2	1 20-Feb-21	6.387	0.348 05-Mar-21	0.972 30-Nov-21 0.6 07-Dec-21 1.871 14-Dec-21 1.8705 18-Dec-21	0.7255 28-Nov-21	9.499
			0.1 28-Mar-21		1 09-Oct-21					
			0.012 07-Oct-21							
6.	Pakistan	-	-	-	-	-	-	-	-	-
7.	Sri Lanka	0.5	28-Jan-21	0.5	24-Feb-21	0.264	06-Mar-21			1.264
India's Total Supply of Vaccine to SAARC Countries										35.6858
India's Total Supply of Vaccine to 101 Countries of the World (including SAARC)										239.0297
SAARC Countries' Share (%) in India's Total Supply of Vaccine										14.93

Source: Ministry of External Affairs, Govt. of India (<https://mea.gov.in/vaccine-supply.htm>)

**Table 5.** India's Pharmaceutical Trade Intensity Index with SAARC Nations

Year	Export Intensity Index (EII)				Import Intensity Index (III)			
	<i>Ind-Ban</i>	<i>Ind-Nep</i>	<i>Ind-Pak</i>	<i>Ind-Slk</i>	<i>Ind-Ban</i>	<i>Ind-Nep</i>	<i>Ind-Pak</i>	<i>Ind-Slk</i>
2007	13.44	NA	3.69	40.76	NA	NA	0.02	17.13
2008	14.30	NA	4.12	35.17	0.005	NA	0.002	14.80
2009	12.58	37.43	3.40	37.34	0.001	494.17	0.02	20.96
2010	10.01	21.56	2.74	35.88	0.07	135.02	0.02	10.24
2011	10.26	31.43	3.30	21.32	0.28	137.50	0.11	49.12
2012	9.87	29.35	2.37	18.93	0.08	127.31	0.06	35.31
2013	14.68	34.35	2.48	18.50	0.01	149.85	0.005	18.72
2014	NA	30.98	2.76	17.79	NA	149.30	0.005	9.53
2015	8.08	17.86	2.06	16.31	0.15	177.95	0.005	8.07
2016	NA	29.03	2.54	15.70	NA	128.26	0.04	14.70
2017	NA	33.41	3.32	18.06	NA	141.13	0.04	9.34
2018	NA	28.24	3.20	NA	NA	125.70	0.001	NA
2019	NA	28.99	2.99	14.92	NA	118.19	0.03	39.76
2020	NA	NA	2.94	16.15	NA	NA	0.03	36.06
2021	NA	NA	1.87	9.24	NA	NA	0.02	20.31

Source: Authors' computation based on Comtrade data

Note: NA- Data not available

The notion of comparative advantage drives the fundamental aspects of international trade. Countries having distinct comparative advantages have more opportunities for beneficial trade than countries having a higher degree of similarity (Pitigala, 2005). The index of RCA is a useful indicator of comparative advantage. Table 6 shows the indexes of RCA for bulk drugs and drug formulations for India and other major SAARC countries for the period 2007-2021. In case of bulk drugs, none of the SAARC countries has an RCA index greater than one, highlighting the fact that these countries have been at a comparative disadvantage position throughout the years. For India, the index of RCA for bulk drugs shows a declining trend up to 2010, followed by an increasing trend upto 2015, but since 2016 it shows a continuous declining trend. Throughout, the index remains below unity, indicating India's comparative disadvantage in bulk drugs. In case of drug formulations, India's RCA index is greater than one throughout the years, indicating the comparative advantage India is enjoying in formulations. The index shows a consistent upward trend, suggesting that India has maintained its progress toward greater competitive advantage in formulations over the years. India's comparative advantage in this high-tech sector reflects the capacity that the industry has built up over the years through the process of reverse-engineering. Despite some progress made by Nepal and Pakistan, all the selected South Asian countries are at comparative disadvantage in this sector, underlining that India can improve its trading relationship with these countries in drug formulations. Bangladesh and Sri Lanka must make significant strides toward developing 'revealed' comparative advantage to export pharmaceuticals to other nations. The analysis reveals that India has a good potential for exporting drug formulations to other South Asian countries to meet their medicinal requirements. Thus, India's prospects for benefitting from increased pharmaceutical trade with other low RCA countries of South Asia appear to be quite promising. But the converse is not true.

**Table 6.** RCA Index of Pharmaceuticals for SAARC Nations

Year	India		Bangladesh		Nepal		Pakistan		Sri Lanka	
	BD	F	BD	F	BD	F	BD	F	BD	F
2007	0.903	1.221	0.007	0.140	NA	NA	0.334	0.194	0.024	0.010
2008	0.788	1.367	0.007	0.119	NA	NA	0.191	0.234	0.021	0.010
2009	0.741	1.034	0.011	0.096	0.027	0.076	0.151	0.295	0.015	0.008
2010	0.706	1.356	0.006	0.105	0.049	0.360	0.168	0.253	0.012	0.010
2011	0.739	1.470	0.019	0.105	0.102	0.670	0.157	0.269	0.027	0.007
2012	0.736	1.819	0.004	0.116	0.062	0.639	0.125	0.337	0.014	0.008
2013	0.796	1.909	0.007	0.142	0.002	0.581	0.074	0.362	0.015	0.008
2014	0.752	1.897	NA	NA	0.002	0.586	0.063	0.420	0.021	0.012
2015	0.840	2.264	0.002	0.112	0.002	0.483	0.055	0.470	0.014	0.011
2016	0.809	2.224	NA	NA	0.032	0.471	0.038	0.471	0.014	0.007
2017	0.683	2.050	NA	NA	0.044	0.587	0.021	0.464	0.019	0.011
2018	0.658	2.093	NA	NA	0.071	0.407	0.019	0.416	NA	NA
2019	0.639	2.227	NA	NA	0.081	0.381	0.017	0.424	0.024	0.014
2020	0.647	2.566	NA	NA	NA	NA	0.018	0.426	0.015	0.015
2021	0.449	2.019	NA	NA	NA	NA	0.008	0.413	0.011	0.018

Source: Authors' computation based on Comtrade data

Note: NA- Data not available; BD- Bulk Drugs (SITC 541, Rev. 3); F- Drug Formulations (SITC 542)

In order to investigate the extent of complementarity in trading pharmaceutical products between India and other major SAARC nations, the indexes of trade complementarity are calculated for the period 2007-2021. The complementarity indexes for India's trade in pharmaceuticals with SAARC nations and SAARC nations' trade with India are reported in Table 7. A country-by-country comparison reveals that the complementarity between India's offer and Nepal's demand has been quite strong over the years. On an average, the index has been 0.98. However, there is a clear lack of complementarity between Nepal's offer and India's demand, the index being 0.43, on average. Thus, in case of bilateral pharmaceutical trade between India and Nepal, there arises a situation of partial complementarity which indicates that India is able to meet the import demands of Nepal, but Nepal has a significant lack of such potential. The same is also true in the case of India-Pakistan bilateral trade. India's offer matches with Pakistan's demand fairly, but the opposite is not true. Further, the indexes of trade complementarity for both India's offer to Pakistan and Pakistan's offer to India show a gradually declining trend which indicates that the mutual dependency of both the countries on pharmaceutical trade has been declining over time.

**Table 7.** Trade Complementarity Index for Pharmaceuticals among SAARC Nations

Year	Ind-Ban	Ind-Nep	Ind-Pak	Ind-Slk	Ban-Ind	Nep-Ind	Pak-Ind	Slk-Ind
2007	0.460	NA	0.742	0.969	0.388	NA	0.757	0.829
2008	0.421	NA	0.727	0.998	0.441	NA	0.650	0.855
2009	0.473	0.997	0.755	0.966	0.466	0.547	0.591	0.840
2010	0.445	0.970	0.715	0.994	0.427	0.459	0.636	0.765
2011	0.471	0.984	0.713	0.974	0.480	0.466	0.620	0.985
2012	0.425	0.985	0.652	0.989	0.467	0.494	0.604	0.873
2013	0.416	0.977	0.652	0.987	0.412	0.391	0.483	0.877
2014	NA	0.985	0.660	0.990	NA	0.328	0.400	0.835
2015	0.432	0.964	0.675	0.990	0.328	0.322	0.380	0.779
2016	NA	0.983	0.702	0.994	NA	0.396	0.402	0.859
2017	NA	0.984	0.733	0.996	NA	0.427	0.413	0.858
2018	NA	0.971	0.734	NA	NA	0.424	0.357	NA
2019	NA	0.962	0.705	0.972	NA	0.491	0.399	0.890
2020	NA	NA	0.727	0.962	NA	NA	0.325	0.751
2021	NA	NA	0.302	0.736	NA	NA	0.420	0.780
Average	0.443	0.978	0.680	0.966	0.426	0.431	0.496	0.841

Source: Authors' computation based on Comtrade data

Note: NA- Data not available

In the case of India-Sri Lanka bilateral trade, India's supply capability fairly matches with the demand potential of Sri Lanka. Similarly, the supply capability of Sri Lanka roughly corresponds to the demand potential of India. Thus, in case of India-Sri Lanka bilateral trade in pharmaceuticals, there arises a situation of what has been described in the literature as 'reciprocal trade complementarity' (Panchmukhi, 1990; Sikdar, 2006). As regards India-Bangladesh bilateral trade, the measure of compatibility between India's offer and Bangladesh's demand is 0.44, while in the case of Bangladesh's offer to India, it is 0.43. Thus, a situation of poor complementarity exists between India and Bangladesh in trading pharmaceutical products.

### Conclusion and Policy Suggestions

Pharmaceuticals, as a 'high-social-value' industrial sector with a direct link to human health and well-being, would be a key segment in which South Asian nations can integrate and strengthen their regional economic cooperation. This study has attempted to investigate the prospects of India's pharmaceutical trade relationship with SAARC nations in the light of some select trade indicators. The analysis reveals that India's pharmaceutical trade with other SAARC nations continues to remain very low, accounting for only 3.99 percent of its global pharmaceutical trade. India maintains a favourable pharmaceutical trade balance with all the other SAARC nations, possibly because their pharmaceutical industries are still in their infancy. An analysis of export intensity index reveals that India has an intense export relationship with all the other South Asian countries, suggesting the possibility of future integration. Further, import intensity of India is found to be well above the expected level for Nepal and Sri Lanka over the years. It is lesser than expected for Bangladesh and Pakistan, underlining an unintense presence of their pharmaceutical products in Indian market. From the calculation of RCA, it is observed that, for bulk drugs, none of the SAARC nations has an RCA index greater than one, highlighting the fact that these countries have been at a comparative disadvantage position throughout the years. In the case of drug formulations, except for India, none of the other South Asian countries enjoys comparative advantage in it. India has maintained its progress toward greater competitive advantage in drug formulations over the years. Moreover, the inference from the computation of trade complementarity index reveals a fair degree of complementarity among SAARC nations in trading pharmaceuticals. There is, thus, a significant room for pharmaceutical trade between these countries to expand and enormous potentials to be realized. To capitalize on these opportunities, SAARC countries must strengthen their economic cooperation and regional integration.

This study also brings to light the role of India's pharmaceutical sector in ensuring critical medical supplies in South Asian during the COVID-19 crisis. Based on the analysis, it seems that the COVID-19 has aided in bringing the countries of the region together for coordinated efforts to combat the outbreak of the pandemic. Being 'the Pharmacy of the World', India has taken the leadership role and supplied essential medicines, vaccine and other critical healthcare instruments to over 100 countries, including those in its immediate neighbours in sprits of its 'First Responder to a Crisis' and 'Neighbourhood First Policy'. The country has built a development cooperation model through the 'Vaccine Maitri' initiative and established itself as the first responder to a crisis like COVID-19, thereby strengthening its diplomatic standing in South Asia. Therefore, it is possible to argue that India's increased collaboration during the COVID-19 pandemic has been a humanitarian act that will not only ensure fair and equitable access to medicine for all, but also aid strengthen its ties with neighbouring nations.

## References

- Ahmad, N., Qayum, A., & Iqbal, A. (2017). Evolving patterns and empirical distribution of normalized revealed comparative advantage: A SAARC countries analysis. *Journal of Applied Economics and Business Research*, 7(1), 59-82.
- Ahmed, A., Chakraborty, D. & Bhattacharya, R. (2020). The Recent Coronavirus (COVID 19) Pandemic: A Review of Issues for Indian Pharmaceutical Exports. *Foreign Trade Review*, 55(3), 418-435.
- Ahmed, V., & Batool, S. (2017). India–Pakistan trade: a case study of the pharmaceutical sector. In *India-Pakistan Trade Normalization*, Springer, pp. 219-244.
- Air News. (2020, 8 May). India sends 12.5-tonne gift consignment of essential medicines & medical items to Sri Lanka. <https://newsonair.gov.in> (accessed on 09/08/2022).
- Akram, A., & Mahmood, Z. (2012). Determinants of intra-industry trade between Pakistan and selected SAARC Countries. *The Pakistan Development Review*, 51(1), 47-59.
- Alesina, A., Spolaore, E., & Wacziarg, R. (2005). Trade, growth and the size of countries. In *Handbook of economic growth* (Vol. 1), Elsevier, North Holland.
- ANI. (2020a, 20 April). Afghan President thanks PM Modi for medical supplies to fight COVID-19. <https://www.aninews.in> (accessed on 09/08/2022).
- ANI. (2020b, 26 November). India gifts 2,000 vials of Remdesivir, Covid-19 related assistance to Nepal. <https://www.aninews.in> (accessed on 09/08/2022).
- ANI. (2022, 15 March). Maldives President Solih thanks India for 'generous' COVID, financial aid in last 2 years. <https://www.aninews.in> (accessed on 09/08/2022).
- Balassa, B. (1965). Trade Liberalization and “Revealed” Comparative Advantage. *Manchester School of Economic and Social Studies*, 33(2), 99-123.
- Banik, N., & Kim, M. (2020). India–ASEAN trade relations: Examining the trends and identifying the potential. *Global Business Review*, pp.1-19. <https://doi.org/10.1177/0972150920953546>
- Baysan, T., Panagariya, A., & Pitigala, N. (2006). Preferential Trading in South Asia. *World Bank Policy Research Working Paper No. 3813*, pp.1-29.
- Business Research Company. (2020). Global Pharmaceuticals Market Opportunities and Strategies Report. <https://www.thebusinessresearchcompany.com> (accessed on 22/08/2022).
- Chatterjee, B., & George, J. (2013). Reforming non-tariff barriers: Case for a participatory approach in South Asia. In *Consumer unity and trust society*, July, pp.132–138.
- Chaturvedi, P., Hussain, Z., & Nag, B. (2015). SAARC geopolitics and trade: Missing intra-regional connectivity a hindrance to further economic integration. *South Asian Survey*, 22 (1), 78-106.
- Chen, J., Chen, D., & Yao, A. (2020). Trade development between China and countries along the Belt and Road: A spatial econometric analysis based on trade competitiveness and complementarity. *Pacific Economic Review*, 25(2), 205-227.
- Comtrade. (2021). *United Nations Commodity Statistics Trade Database*. Retrieved from <https://comtrade.un.org/> (accessed on 22/09/2022).
- Das, P., & Das, S. (2015). Competitiveness and its Impact on Research and Development in Indian Pharmaceutical Industry. *Decision*, 42(3), 325-334.
- DD News. (2020, 6 May). India hands over 3rd tranche of emergency medical assistance to Bangladesh. <https://ddnews.gov.in> (accessed on 08/08/2022).
- Dennis, A. (2006). The Impact of Regional Trade Agreements and Trade Facilitation in the Middle East and North Africa Region. *World Bank Policy Research Working Paper No. 3837*, pp.1-24.



- Department of Pharmaceuticals. (2020). *Annual Report, 2020-21*. Ministry of Chemicals and Fertilizers, Government of India. <https://pharmaceuticals.gov.in/annual-report> (accessed on 21/07/2022).
- Department of Pharmaceuticals. (2021). *Annual Report, 2021-22*. Ministry of Chemicals and Fertilizers, Government of India. <https://pharmaceuticals.gov.in/annual-report> (accessed on 23/08/2022).
- FICCI. (2022). Impact of the Pharma Industry on the Indian Economy in the Post-COVID Era, *A Report by KPMG in India and FICCI, April, 2022*, <https://ficci.in/studies.asp> (accessed on 02/07/2022).
- Firstpost. (2020). From COVID-19 vaccines to oxygen, a look at how India helped SAARC countries during pandemic. <https://www.firstpost.com> (accessed on 09/08/2022).
- Goyal, K. A., & Vajid, A. (2018). An Analysis of India's Trade Intensity with UAE. *Journal of Commerce and Trade*, 13(1), 27-31.
- Heng, T. M., & Gayathri, V. (2004). Impact of Regional Trade Liberalization on Emerging Economies: The Case of Vietnam. *ASEAN Economic Bulletin*, 21(2), 167-182.
- Hoque, A., & Das, S. (2021). Trends in Productivity Growth of Indian Pharmaceutical Industry: A Growth Accounting Analysis. *Journal of Pharmaceutical Research International*, 33 (47A), 437-446.
- Hussain, I. (2011). *Prospects and Challenges for Increasing India-Pakistan Trade*. Atlantic Council, Washington DC.
- IBEF. (2022). *Indian Pharmaceuticals Industry Report, March, 2022*, India Brand Equity Foundation. <https://www.ibef.org/industry/pharmaceutical-india.aspx> (accessed on 23/08/2022).
- Islam, A. M. (2018). Inter-and Intra-industry Trade Relations between Bangladesh and India: Empirical Results. *FIIIB Business Review*, 7(4), 280-292.
- Jain, R., & Singh, J. B. (2009). Trade pattern in SAARC countries: Emerging trends and issues. *Reserve Bank of India Occasional Papers*, 30(3), 73-117.
- Katti, V. (2007). India and the Regional Economic Integration in South Asia. *Indian Foreign Affairs Journal*, 2(4), 93-116.
- Kaur, S., & Nanda, P. (2010). India's export potential to other SAARC countries: A gravity model analysis. *Journal of Global Economy*, 6(3), 167-184.
- Kojima, K. (1964). The Pattern of International Trade among Advanced Countries, *Hitotsubashi Journal of Economics*, 5(1), 16-36.
- Kumar, R. (2020). India & South Asia: Geopolitics, regional trade and economic growth spillovers. *The Journal of International Trade & Economic Development*, 29(1), 69-88.
- Kumar, R., & Singh, M. (2009). India's role in South Asia trade and investment integration. *ADB Working Paper Series on Regional Economic Integration No. 32*, Asian Development Bank.
- Kumar, S., & Ahmed, S. (2014). Growth and Pattern of Intra-Industry Trade between India and Bangladesh: 1975-2010. *The Journal of International Economic Policy*, 2(21), 5-28.
- Kumar, S., and S. Ahmed. (2015). Gravity model by panel data approach an empirical application with implications for South Asian Countries. *Foreign Trade Review* 50 (4), 233-249.
- Li, K. (2018). China and India trade competition and complementary: analysis of the "Belt and Road" background. *Modern Economy*, 9(7), 1213-1227.
- Li, W., & Li, C. (2020). The Empirical Study on Potential of Bilateral Trade between China and Kenya in the Context "The Belt and Road". *Theoretical Economics Letters*, 10(1), 119-130.
- Ma, S. (2022). Growth Effects of Economic Integration: New Evidence from the Belt and Road Initiative. *Economic Analysis and Policy*, 73, 753-767.

- Madhusoodanan, P. R. (2010). An empirical examination of trade flows in the SAARC region. *International Journal of Business and Globalization*, 5(3), 273-279.
- Manocha, R. (2018). Impact of regional trade agreements on India's trade potential: the case of SAARC and APTA. *FOCUS: Journal of International Business*, 5(1), 14-36.
- Michaely, M. (1996). Trade preferential agreements in Latin America: an ex-ante assessment. *World Bank Policy Research Working Paper No. 1583*, pp.1-55.
- Moinuddin, M. (2013). Fulfilling the promises of South Asian integration: Gravity estimation. *ADB Working Paper 415*, pp. 1-33.
- Panchamukhi, V. R. (1990). *Economic Cooperation in the SAARC Region: Potential, Constraints and Policies*, Interest Publication, New Delhi.
- Pant, M., & Pande, D. (2017). India–Pakistan trade: An analysis of the pharmaceutical sector. In *India-Pakistan Trade Normalization*, Springer, pp.163-218.
- Pattanaik, S. S. (2021). COVID-19 pandemic and India's regional diplomacy. *South Asian Survey*, 28(1), 92-110.
- Pharmexcil. (2018). *Regulatory and Market Profile of Sri Lanka*. Ministry of Commerce and Industry, Govt. of India. <https://pharmexcil.com> (accessed on 14/06/2022).
- Pharmexcil. (2020). *Annual Report 2020-21*. Ministry of Commerce and Industry, Govt. of India. <https://pharmexcil.com/annual-report> (accessed on 23/08/2022).
- Pitigala, N. (2005). *What does regional trade in South Asia reveal about future trade integration? Some empirical evidence* (Vol. 3497), World Bank Publications.
- PMO India. (2021, 20 January). Press Release. <https://www.pmo.gov.bt/press-release-january-20-2021/> (accessed on 12/08/2022).
- Puranwala A. (2020). *Covid-19 vaccine update - The Covid-19 vaccination race has just begun; India aptly placed*. <https://images.assettype.com> (accessed on 08/08/2022).
- Qamar, A. (2005). Trade between India and Pakistan: Potential Items and the MFN Status. *State Bank of Pakistan Research Bulletin*, 1(1), 45-57.
- Raghuramapatruni, R. (2011). The Experience of SAARC as a regional bloc and its future potentialities. *Indian Journal of Economics & Business*, 10(1), 57-72.
- Raghuramapatruni, R., Senthil, M., & Gayathri, N. (2021). The Future Potential and Prospects of SAARC Regional Grouping: A Study. *India Quarterly: A Journal of International Affairs*, 77(4), 579-604.
- Rahman, M. M. (2008). Macro-economic and trade link models of SAARC countries: An investigation for regional trade expansion, *Journal of Asia Pacific Economy*, 13(1), 50–62.
- Rahman, M., Shadat, W. B. and Das N. C. (2006). *Trade Potential in SAFTA: An Application of Augmented Gravity Model*, Centre for Policy Dialogue, Dhaka.
- Sharma, H. (2013). A Measurement of India's Trade Intensity with SAARC Countries. *Journal of Commerce and Trade*, 8(12), 76-84.
- Sharma, N., & Kumar, P., (2012). Growth and Pattern of India's Intra-industry Trade with SAARC Nations. *The Indian Economic Journal*, 60(2), 114–125.
- Sharma, V. (2021). Indo-SAARC Trade Trend during COVID-19 Era. *Turkish Journal of Computer and Mathematics Education*, 12(2), 195-198.
- Sharun, K., & Dhama, K. (2021). India's role in COVID-19 vaccine diplomacy. *Journal of Travel Medicine*, 28(7), pp.1-4. <https://doi.org/10.1093/jtm/taab064>.
- Sikdar, C. (2006). Prospects of bilateral trade between India and Bangladesh. *Foreign Trade Review*, 41(1), 27-45.
- Singh, B., Singh, S., Singh, B., & Chattu, V. K. (2022). India's Neighbourhood Vaccine Diplomacy during COVID-19 Pandemic: Humanitarian and Geopolitical Perspectives. *Journal of Asian and African Studies*, pp.1-17. <https://doi.org/10.1177/00219096221079310>

- Srivastava, R. K., & Green, R. T. (1986). Determinants of Bilateral Trade Flows. *The Journal of Business*, 59(4), 623-640.
- Suhail, M. T., & Khan, M. A. (2022). Impact of COVID-19 on India's trade with SAARC nations. *EPRA International Journal of Economics, Business and Management Studies*, 9(9), 1-9.
- Taneja, N., Prakash, S., & Kalita, P. (2013). India's role in facilitating trade under SAFTA. *Working Paper No. 263*, ICRIER, pp.1-19.
- The Economic Times. (2020, 7 April). India gifts a 10-tonne consignment of medicines to Sri Lanka. <https://economictimes.indiatimes.com> (accessed on 09/08/2022).
- The Hindu. (2020, 30 September). Maldives thanks India for \$250 million support amid COVID-19 pandemic. <https://www.thehindu.com>(accessed on 09/08/2022).
- The Kathmandu Post. (2020, 22 April). India gifts 23 tonnes of essential medicines to Nepal to fight Covid-19. <https://kathmandupost.com> (accessed on 09/08/2022).
- Vahalik, B. (2014). Regional bilateral trade analysis of the European Union, China and ASEAN. *Procedia Economics and Finance*, 12, 709-717.
- WHO (World Health Organization). (2022). *WHO Coronavirus (COVID-19) Dashboard*. <https://covid19.who.int/> (accessed on 05/08/2022).
- World Integrated Trade Solution. (2010). *Trade Indicators*, the World Bank, <https://wits.worldbank.org/wits> (accessed on 24/6/2022).
- Xu, S. (2017). China and South Asia trade competition and complementary: Analysis based on the background of "One Belt and One Road". *Chinese Studies*, 6(2), 108-122.