



PRODUCTION AND TRADE OF CHICKPEA (*CICER ANEITYUM*) IN INDIA AND MYANMAR

Nyein Aye Khine^a, K.K.Kundu^b, D.P. Malik^c and Janailin.S. Papang^d

^aM.Sc student, Department of Agricultural Economics, CCS Haryana Agricultural University, Hisar, Haryana, 125004. E-mail: nyeinmyeinayekhine@gmail.com

^bAssociate Professor, Department of Agricultural Economics, CCS Haryana Agricultural University, Hisar, Haryana, 125004. E-mail: kundu.dr@gmail.com

^cProfessor & Head, Department of Agricultural Economics, CCS Haryana Agricultural University, Hisar, Haryana, 125004. E-mail: agecon@hau.ac.in

^dAssistant Professor, Department of Agricultural Economics, CCS Haryana Agricultural University, Hisar, Haryana, 125004. E-mail: janai4ndri@gmail.com

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Abstract: Chickpea is an important legume crop in India and Myanmar. Production remained stagnant in both countries until 2000 (Period-I, II, and III) and increased late after 2010 (Period-IV and V). The highest productivity was recorded in 2018-19 (1041 kg/ha in India and 1478 kg/ha in Myanmar). The growth rate of chickpea in India was found to be the highest in period-IV (4.32% in area, 5.99% in production and 1.60% in yield). Similarly, the growth rate of chickpea in Myanmar was the highest in the period-IV (7.57% in area, 13.59% in production, and 5.60% in yield) due to promotion of export markets, favorable prices in the domestic market and partly due to research and development in Department of Agricultural Research (DAR). Myanmar's instability performance was higher than that of India in all decades except 2010-19. In the case of the import-export scenario, India is now producing sufficiently in domestic production while s, till the chickpea imports, are for processing and value-added products. Myanmar has exported chickpea to the rest of the world especially India (80%), Malaysia, Pakistan, Singapore and the United Arab Emirates. The growth rate of chickpea exports in India increased in the period 1988-2008 (79.33% in terms of quantity and 94.14% in terms of value) as the growth rate of imports was also increasing in the same period (15.97% in terms of quantity and 21.88% in terms of value). The growth rate of chickpea exports in Myanmar showed a decrease in all periods (-4.4%, -0.52% and -4.95%).

Keywords: Chickpea, Export, Import, Growth rate, Instability

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1. INTRODUCTION

The most commonly used pulse is chickpea. Chickpea (*CicAneityumnum*) plays an essential role in all classes of Indian consumers. Due to its reasonable price increase its vegetarian population, chickpea production has always been increasing year by year; in addition, India has been ranked first in chickpea production in the world. Chickpea is grown almost all over the country as a rain-fed crop (68% area). During 2018-19, chickpea production was increased to about 9,938 thousand tons, which represents 45 percent total production of pulses (29,156 thousand tons) in India. Among the chickpea growing states, Madhya Pradesh, Maharashtra, Rajasthan, Karnataka and Uttar Pradesh contribute about 86 percent of the total production. In India, both desi Kabuli chicks are grown. In recent years, the country has witnessed a remarkable increase in the area, product, Ion, and productivity of chickpea. On the other hand, it is the largest importer and exporter of chickpea. Indian imports are mainly of desi type, which accounted for about 1percentcent of global imports in 2019. In contrast, Indian exports of chickpea, which make up about 12 percent of the country's total pulses exports, are mainly of Kabuli chickpea.

Chickpea is mostly grown in the delta and central regions depending on the season. In the delta region, area and yield are affected due to unforeseen weather conditions such as floods, hurricanes and other disasters. In the case of the dry region, severe drought and insufficient agricultural water were the main factors of yield uncertainty in India and Myanmar. Other factors such as scarcity of labor, unstable markets, t and cost of agriculture were the main facts of the region's diversity.

In Myanmar, locally called "ka-la-pe", chickpea has occupied a vital role in consumption and export earnings. In the case of consumption, chickpea is the most famous for its taste, flavor, or usefulness among all the people in Myanmar. The most prominent processing industry for cooked chickpea is split gram and split gram flour while the Kabuli type is mainly grown for export. Gram flour is useful in making tofu and is also one of the main ingredients of Monhinger (Myanmar's well-known vermicelli soup). Myanmar is another country that has seen a sharp rise in chickpea production, especially since the late 1990s. It is mainly grown in the central dry region of the country, mainly in the departments of Sagaing (59%), Magway (14%), Mandala,(2%) and Bago (5%). The annual production of chickpea in Myanmar, which amounted to about 117 thousand tons in 2000-2001, increased to about 564.85 thousand tons in 2018-2019. Among the developing countries where chickpea is grown, Myanmar was remarkably succeeded in widespread adoption of the improved cultivar [4]. The growth

rate of chickpea is increasing in both countries, while the inflow and outflow of chickpea especially for aredia are also high at present. The present study was conducted to achieve the following specific objectives: (1) to work out the truth nandin area, production, and productivity of chickpea and (2) to analyze the export-import scenario of chickpea.

2. METHOTIME-SERIES

Series data were collected from 1970-71 to 2018-19 to show trends in the area, production and productivity of chickpea for both countries. Data from INDIASTAT for India, Indian Institute of Pulses Research (IIPR) and Department of Agriculture (Myanmar) for Myanmar were extracted to determine trends in the area, production and productivity of chickpea and also work out the compound annual growth rate and instability. In the area, production and productivity for both countries. Similarly, data on the chickpea trade from 1988 to 2019 was also collected for India and Myanmar to analyze the growth rate of chickpea export and import. The data function C, COMTRADE, APEDA and Central Statistical Organization (Myanmar) were compiled for analyzing growth rates. Moreover, ITC trade map data were used for both countries to show trade performance with major destination countries.

For studying the decadal growth patterns and overall the growth in the area, production and productivity and for a better understanding of the fluctuations in the growth of chickpea year by year, the study period (1970-71 to 2018-19) were subdivided into (1) Period-I (1970-71 to 1979-80); (2) Period-II (1980-81 to 1989-90); (3) Period-III (1990-91 to 1999-2000); (4) Period-IV (2000-01 to 2009-2010); (5) Period-V (2010-11 to 2018-19); and (6) Overall period (1970-71 to 2018-19).

Analytical Framework

(i) Compound Annual Growth Rate (CAGR%)

Simple compound growth rate formula was calculated for the elaborate trend in the production, and productivity of chickpea.

$$Y_t = ab^t$$

Where,

Y_t = area, production and productivity of pulses in the year t

a = intercept

b = regression coefficient

t = time variable

The compound growth rate (r) was obtained for the logarithmic form of the equation as below:

$\text{Log}Y = \text{Log}a + \text{Lo}T$ The percent ntt compound growth rate [r] was estimated as,

$$r = (\text{antilog}b - 1) \times 100$$

(b) Instability Analysis (CV%)

Karl Pearson's coefficient of variation is used to analyze the instability during the period. The standard Deveron as percentage of mean is called Goethe efficient of variation.

$$\text{Coefficient of Variation CV (\%)} = \frac{\sigma}{\text{mean}} \times 100$$

Where Standard deviation= variables concerned with area/production/productivity

Mean = mean value of the concerned variable

3. RESULTS AND DISCUSSION

3.1. Trends in Area, Production, and Yield of Chickpea in India and Myanmar

The result showed that the chickpea producing area in India was found to be decreased in the first three periods (period-I, II and III), but recently the area increased again in the latter two periods (period-IV and V). The results indicated that the chickpea cultivation area has increased across the study periods as it showed an increase in 839 thousand ha in 1970-71 to 9,547 thousand ha in 2018-19. However, the percentage change of chickpea area and production between the different decades was found declining the earlier period and later (period-IV) it increased 77.16 percent and the percentage in production, respectively, again decreased slightly by only percent center ea and 20.8 percent in production in the r erentade. It may be due to increasing the cultivation of other major pulses sulentilslentil. The area of chickpea moved from the traditional Indian Green Revolution belt to the central and southern parts [1]. The gram production also increased from 5,199 thousand tons in 1970-71 to 9,938 thousand tons in 2018-19 with the increase in the level of the yield. Although this increase has not been homogeneous throughout this period, it has been prominent in the last decade. The yield was stable from the first two periods, but the yield increased steadily and reached the highest level in 2018-19. Thus, the results can be concluded that the increase in production was mainly through increased yield.

The results from Myanmar revealed that the area has gradually expanded in the first four decades. The yield also stagnated in the first four periods; however, it increased more than double in 2010-11 and 2018-19 decadal periods. Production unexpectedly amounted from 71.08 thousand tons in 1970-71 to 564.85 thousand tons in 2018-19. The improved yield was based on improved varieties [4]. New varieties like Yezin 4 (ICCV 88202) and Yezin 6 (ICCV 92944) for desi types, Yezin 3 (ICCV2) and Yezin 8 (ICCV 97314) Kabuli types, have been introduced by ICRISAT.

The decadal percentage change of chickpea area and production was found to be also decreased in 2018-19 in both countries as a result of the proportion of black gram and green gram even though there has been gain in the amount of area and production. Similarly, the decadal percentage change of production over the period one was found declined in 1980-81 (-16.75%) and 2000-01 (-28.02%). In Myanmar, the decadal percentage change of area and products were five and increased in all the decades, however, there was a negative change in yield (-5.56%) in the decade 1980-81 while, other periods indicated a positive change. Examining the decadal percentage change, it was found that chickpea production in India was directly affected by the area while, in Myanmar; it has shown that the percentage change in the area could not change the production but it was due to the large increase in yield (Table 1).

Table 1: Area, production and, yield of chickpea in India and Myanmar

		Area – Thousand hectares						Production – Thousand Tons	
								Yield – kg/ha	
		1970-71	1980-81	1990-91	2000-01	2010-11	2018-19	Percentage Change in 2018-19 over 1970-71	
India	Area	7839	6585 (-16.00)	7521 (14.21)	5185 (-31.06)	9186 (77.16)	9547 (3.93)	21.79	
	Production	5199	4328 (-16.75)	5356 (23.75)	3855 (-28.02)	8221 (20.30)	9938 (20.89)	91.15	
	Yield	663	657 (-0.90)	712 (8.37)	744 (4.49)	895 (20.30)	1041 (16.31)	57.01	
Myanmar	Area	133.75	149.46 (11.75)	157.98 (5.70)	164.38 (4.50)	333.05 (102.60)	382.18 (14.75)	185.74	
	Production	71.08	102.3 (43.90)	102 (-0.29)	117 (14.71)	473.1 (304.36)	564.85 (19.40)	694.67	
	Yield	531	684 (-5.56)	646 (10.22)	712 (10.22)	1421 (99.58)	1478 (4.01)	178.34	

Source: Indiastat for India, IIPR (G ,O,I) and DOA for Myanmar

The trend in the area, production, and productivity of chickpea fitted in exponential form has been shown in Figure 1 and Figure 2. This was an increase in trend of area, production and productivity in Myanmar (0.0218, 0.0458 and 0.0241) showed that it was higher than that of India (0.0034, 0.0138 and 0.0103) during the study periods 1970-2019.

Figures in parenthesis indicate decadal percentage change

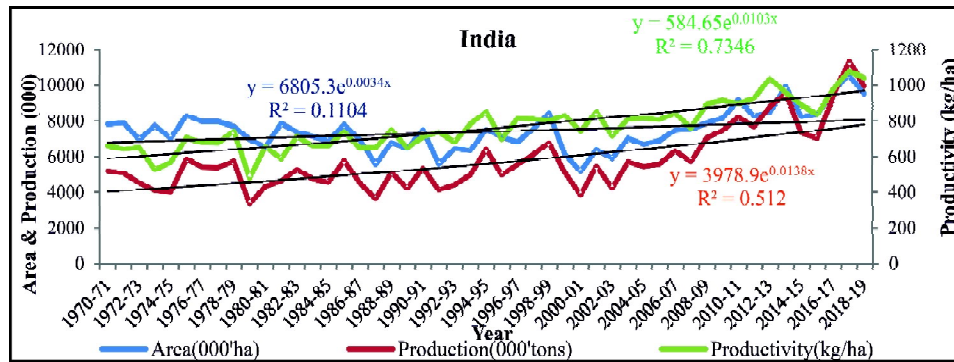


Figure 1: Trends in area, production and productivity of chickpea in India

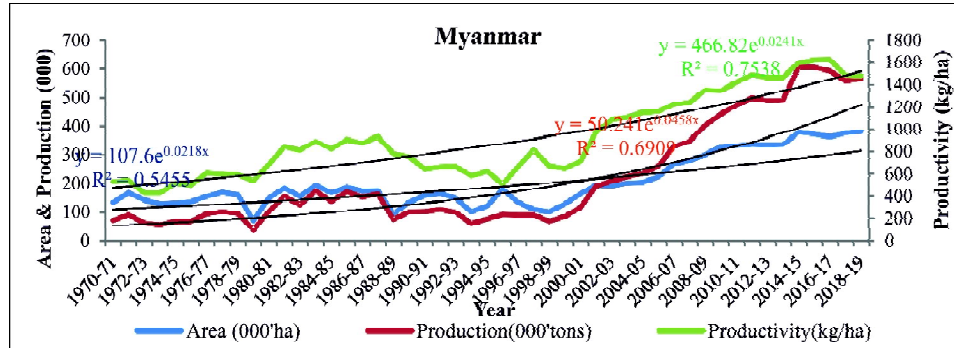


Figure 2: Trends in area, production and productivity of chickpea in Myanmar

3.1.1. Compound annual growth rate of chickpea in India and Myanmar

Table 2 revealed that declining growth rates were found in the first two periods while in others periods the growth rates were inclining in India. In the first period, the declined growth rate (-0.18%) and productivity (-0.41%) did not support adequate growth for the production. Productivity growth (0.74%) in 1980-90 also did not bring increased growth in production due to the high declining growth of the area (-1.53%). The highest growth in area and production was recorded in period-IV in India and Myanmar.

The growth rate of the overall period in India was lower than that of other periods. Likewise, the same situation is found in Myanmar.

In the case of Myanmar, decreasing growth in area provisioning was observed in the first three periods. The highest growth rate was observed in 2000-10 and it was relatively higher than that of India. The increase in area was partly due to promotion of export markets, favorable prices in the domestic market and partly due to research and development in the Department of Agricultural Research (DAR) [5]. Moderate increasing growth of yield did not increase results in production as there was high increasing growth in the area. However, the maximum growth rate has been found in the last two periods in both countries. Myanmar's growth rate in the periphery the od-IV for the area (7.57% production (13.59%) and yield (5.6%) was relatively higher than that of India. Growth rates in area and production decreased again in period-V in both countries. The growth rate of area, production, and yield of chickpea were thus depicted significant at a 1% level of significance in all the periods in India as well as Myanmar.

Table 2: Compound annual growth rate of chickpea in India and Myanmar

(Percent)

Period	India			Myanmar		
	Area	Production	Yield	Area	Production	Yield
Period-I	-0.18*	-0.60*	-0.41*	-2.78*	-0.69*	2.15*
Period-II	-1.53*	-0.80*	0.74*	-3.12*	-2.50*	0.65*
Period-III	1.26*	2.96*	1.69*	-3.32*	-2.52*	0.82*
Period-IV	4.32*	5.99*	1.60*	7.57*	13.59*	5.60*
Period-V	1.60*	2.96*	1.34*	1.94*	2.74*	0.78*
Overall (1970-2019)	0.34*	1.39*	1.04*	2.20*	4.69*	2.44*

Source: Indiastat for India, IIPR (GOI) and DOA for Myanmar, * Significant at 1% level of significance

3.1.2. Instability of chickpea in India and Myanmar

Table 3 revealed that in the case of India, the area of chickpea was showing a fluctuating trend from 6.13 percent to 13. percent duringing period-I to period-IV and decreased in period-V (9.04%). The fluctuation of production also fluctuated from 16. percent in period 1 to 19.4 percent in period-IV and then decreased again in period-V (15.8%). The most notable features in this case are that the smaller the area, the lower the contrast. In the second period, the growth of the area was decreasing in this period, so the minimal variation of chickpea was recorded. The uncertainty in the yield was decreasing from the first to the fifth period. The yield was more stable than

the area and yield. The overall period was characterized by a higher degree of variance than in each decade.

On the contrary, period-wise fluctuations were found to be higher in Myanmar. Higher instability was observed in Myanmar during this period-IV (23.01% in area, 36.95% in production and 16.57% in yield); however, it has declined in the recent period which was lower than that of India. Myanmar's variability in area and production in the first four periods showed more than twice the instability in area and production status over the same period with India. Uncertainty may be due to area and productivity. It is interesting to note that the variability in Myanmar was higher than that in India in an exceptional period (the fifth period). The maximum fluctuations in the total period and period-IV were recorded in both countries. The last decade (2010-19) showed the lowest level of volatility in both countries.

Table 3: Instability (CV) of chickpea in India and Percent

(Per cent)

Period	India			Myanmar		
	Area	Production	Yield	Area	Production	Yield
Period-I	6.13	16.22	12.60	20.61	27.65	12.05
Period-II	9.72	12.91	7.31	18.56	25.06	9.35
Period-III	12.23	15.93	7.74	20.36	18.03	11.84
Period-IV	13.24	19.46	7.77	23.01	36.95	16.57
Period-V	9.04	15.80	8.33	5.99	9.83	5.10
Overall (1970-2019)	14.85	30.05	17.10	43.94	83.24	40.05

Source: Indiastat for India, IIPR (GOI) and DOA for MyanmarExportimport importort scenario of chickpea

Export-import scenario of chickpea in India

The export of chickpea and its percent share from India during the year 1988 to 2019 is mentioned in table 4. India exported a pulses, around 10.16 thousand tons in 1988. The most exported pulse crop in India is chickpea, which made per percent the total pulses exports in 1988 which rose to 60.48 per percent2019. The export quantity and value of chickpea was fluctuating during the year 1988 to 2003 and of late it increased till the present year (2018-19). Thus, chickpea emerged as the major gainers in India's pulse exports over time. The highest exported quantity and value was found in 2013 which was 400.56 thousand tons and 346.9 US\$ million. On the other hand, the lowest exported quantity and value was found in 1997 which was only 0.01 thousand tons and 0.01 US\$ million owing to an increase in

domestic consumption. However, the exported quantity decreased in 2019 (123.49 thousand tons) with a share of 60percentcent in total pulses export. The major export destination countries for Indian chickpea were Algeria, Sri Lanka, UAE, Saudi-Arabia and USA Figures 3 and 4).

During this period, chickpea grew at a very high rate from 207 thousand tons in 1,988 to 1,553 thousand tons in 2017 (table 4). This is because after the 1990s when the Indian domestic market opened up to global trade with its policy liberalization, privatization and globalization, it was expected that there would be easy imports as we would now have more options to import under a strong global regulatory body, WTO [6]. hat the import of chickpea declined significantly after 2004 and import peaked in 2017. This may be because-sufficient in chickpea and they were mainly imported for value addition and export [2]. The imported interpreted value was declining after 2017 answered imported only 371.88 thousand tons in 2019. The major import sources of chickpea to India were depicted in figure 5 and figure 6.

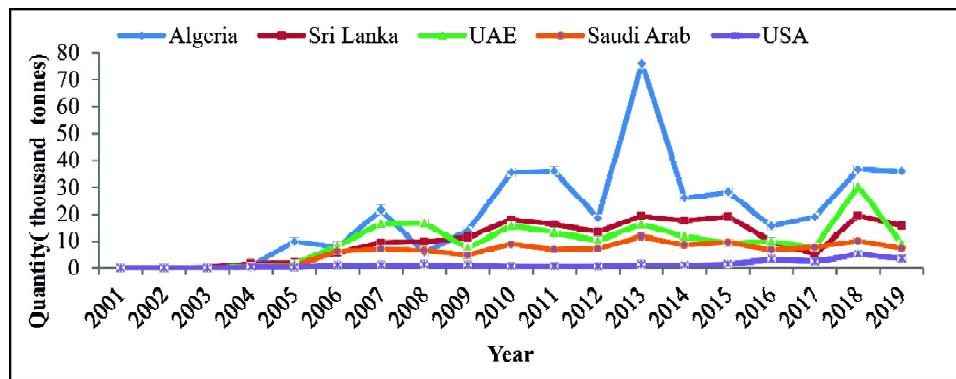


Figure 3: India's export of chickpea to major destination countries (quantity)

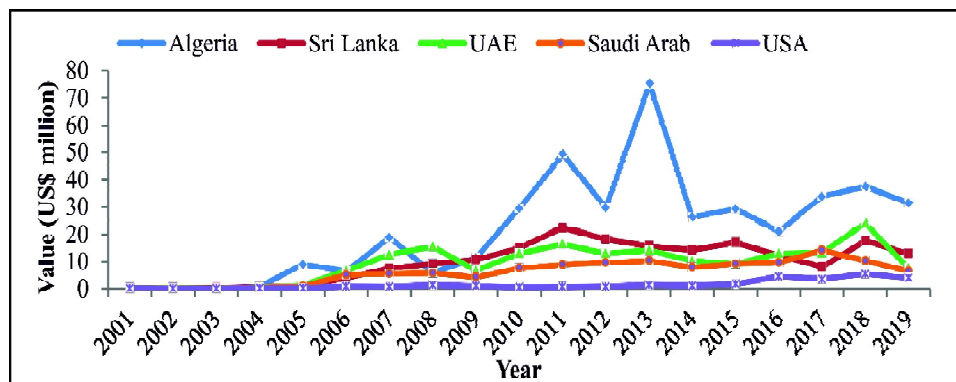


Figure 4: India's export of chickpea to major destination countries (value)

Table 4: Status of India's chickpea export and import

Year	Chickpea's export		Total pulses export		% share in total pulses export		Chickpea's import		Total pulses import		Quantity – Thousand tons Value – US\$ million	
	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
1988	2.93	2.02	10.16	7.93	28.80	25.49	207.01	70.46	858.40	282.47	24.12	24.95
1989	3.51	2.46	13.14	90.85	26.70	24.97	66.99	27.18	536.78	154.42	12.48	17.6
1990	1.85	1.17	15.47	10.13	11.97	11.59	160.12	59.19	1361.07	295.21	11.76	20.02
1991	3.42	1.60	25.86	15.91	13.24	10.08	98.75	32.31	366.25	121.37	26.96	26.62
1992	3.56	1.53	34.35	20.63	10.37	7.51	77.01	27.38	388.59	130.93	19.82	20.9
1993	0.86	0.39	43.62	23.47	1.97	1.67	150.33	50.93	652.98	186.34	23.02	27.33
1994	0.17	0.06	50.72	28.81	0.34	0.22	58.13	27.08	582.12	198.74	9.99	13.62
1995	0.45	0.24	61.36	39.29	0.73	0.62	13.76	12.34	502.23	211.59	2.74	5.83
1996	-	-	55.15	37.06	-	-	122.06	41.36	692.43	264.76	17.63	15.62
1997	0.01	0.01	170.81	97.13	0.01	0.01	380.87	125.23	1084.38	343.88	35.12	36.42
1998	0.24	0.12	103.92	53.00	0.23	0.22	110.13	34.25	628.79	188.69	17.52	18.15
1999	4.07	1.26	194.20	97.45	2.10	1.29	11.03	5.12	269.26	89.37	4.09	5.73
2000	2.10	0.81	228.40	111.83	0.92	0.72	17.75	7.42	261.24	86.59	6.8	8.57
2001	0.83	0.61	166.26	81.75	0.50	0.75	431.08	153.4	1842.44	559.69	23.4	27.41
2002	1.14	0.84	161.72	77.8	0.70	1.07	332.55	105.59	2334.49	659.26	14.24	16.02
2003	1.00	0.74	162.59	74.18	0.62	1.00	241.42	82.57	2068.93	583.10	11.67	14.16
2004	7.98	4.75	207.82	101.98	3.84	4.66	164.38	61.07	1580.76	466.38	10.4	13.09
2005	28.59	22.18	448.58	242.52	6.37	9.15	258.37	111.79	1818.78	584.61	14.21	19.12
2006	62.25	48.59	316.73	206.15	19.65	23.57	126.36	73.42	2207.01	871.38	5.73	8.43
2007	160.7	124.20	183.49	142.07	87.58	87.42	106.89	61.98	2788.81	1273.76	3.83	4.87
2008	103.93	93.89	112.05	101.42	92.75	92.58	202.59	115.85	2623.22	1459.46	7.72	7.94
2009	89.16	75.10	94.44	79.11	94.41	94.93	303.89	149.08	3757.02	2062.01	8.09	7.23

contd. table 4

2010	227.23	188.63	232.62	193.3	97.68	97.59	151.75	85.78	2999.91	1865.61	5.06	4.6
2011	177.45	224.10	181.25	228.49	97.9	98.08	142.78	108.72	3221.94	1850.67	4.43	5.87
2012	143.71	183.8	150.27	190.82	95.64	96.32	471.97	355.55	3815.74	2272.32	12.37	15.65
2013	400.56	346.90	409.93	357.12	97.72	97.14	538.33	324.2	3800.86	2291.17	14.16	14.15
2014	209.14	180.32	236.72	208.41	88.35	86.52	381.31	200.48	4517.34	2684.92	8.44	7.47
2015	187.73	172.95	217.61	209.11	86.27	82.71	688.13	430.37	5413.89	3637.61	12.71	11.83
2016	121.20	144.78	175.53	217.27	69.05	66.63	873.54	688.33	6185.09	4017.16	14.12	17.13
2017	86.99	143.64	136.86	198.19	63.56	72.47	1553.07	1310.75	7002.68	3947.3	22.18	33.2
2018	256.92	237.80	315.96	291.92	81.31	81.46	199.77	127.87	2393.98	1075.71	8.34	11.89
2019	123.49	106.57	204.18	191.56	60.48	55.63	371.88	203.61	3218.07	1553.17	11.56	13.11

Source: UN Comtrade database

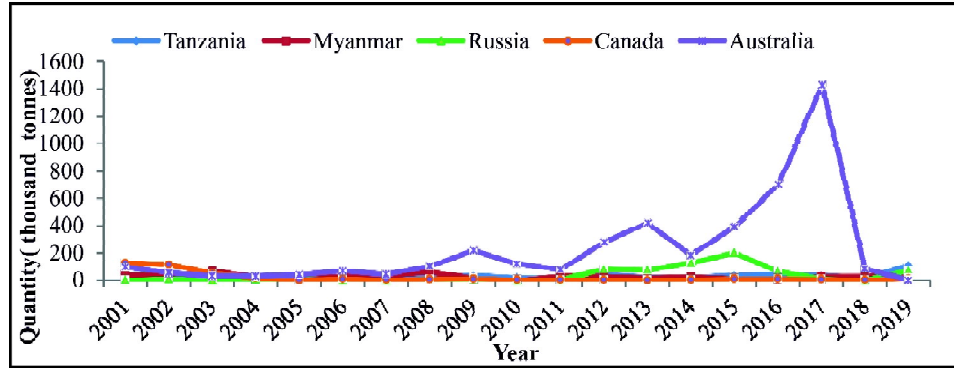


Figure 5: India's import of chickpea from major destination countries (quantity)

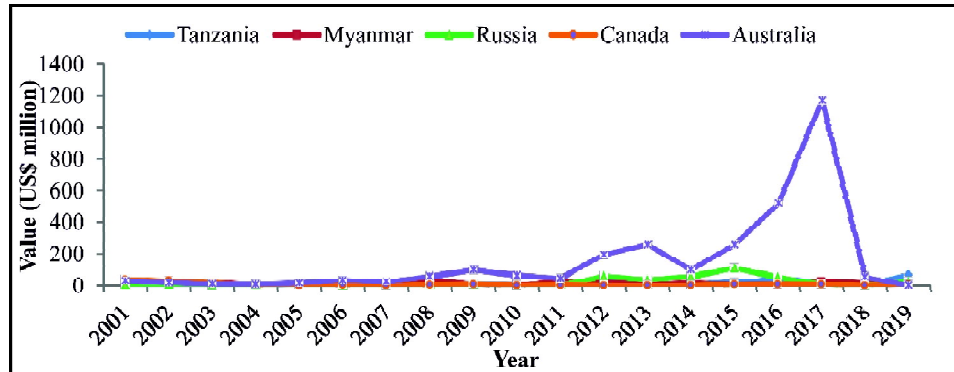


Figure 6: India's import of chickpea from major destination countries (value)

3.2.2. Export of chickpea from Myanmar

Since India was the largest importer of beans and pulses from Myanmar, a huge amount of chickpea was imported by India from Myanmar even though Myanmar was not the largest producer of chickpea. The export of chickpea from Myanmar was declining during the study year from 2006 to 2019. The export of total pulses from Myanmar was 1156 thousand tons in quantity and 609 US\$ million in 2006. The export quantity of chickpea was 46 thousand tons and it increased 85 thousand tons and 98 thousand tons in 2007 and 2008, respectively. The export share of chickpea in total pulses export was 3.98 per cent in quantity and 5.0pepercentin 2006. After 2008, exported quantity and value was declining up to 2019. The highest export volume and value was found in the year 2008 which was 98 thousand tons and 59.86 US\$ million. In the year 2019, the export volume of chickpea was 36 thousand tons with a share of 2.83 percent. The lists of Myanmar's chickpea export partner countries are described in figure 7 and figure 8.

Table 5: Export of chickpea from Myanmar

Quantity – Thousand tons

Value – US\$ million

Year	Chickpea's export		Total pulses export		% share in total pulses export	
	Quantity	Value	Quantity	Value	Quantity	Value
2006	46	30.63	1156	609	3.98	5.03
2007	85	51.26	1141	628	7.45	8.16
2008	98	59.86	1451	744	6.75	8.05
2009	37	22.13	1232	930	3.00	2.38
2010	13	10.25	829	800	1.57	1.28
2011	54	49.9	1296	986	4.17	5.06
2012	64	50	1353	1484	4.73	3.36
2013	19.43	13	1132	743	1.72	1.75
2014	24	17	1242	951	1.93	1.78
2015	17	12	1020	990	1.67	1.21
2016	11	13	1033	1046	1.06	1.24
2017	31	36	1372	918	2.26	3.95
2018	29	18.7	1333	736	2.18	2.54
2019	36	23.47	1272	912	2.83	2.57

Source: CSO (Myanmar) and APEDA

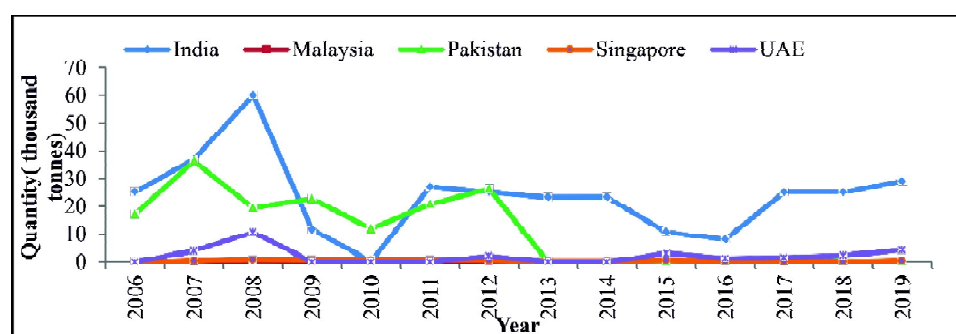


Figure 7: Myanmar's export of chickpea to major destination countries (quantity)

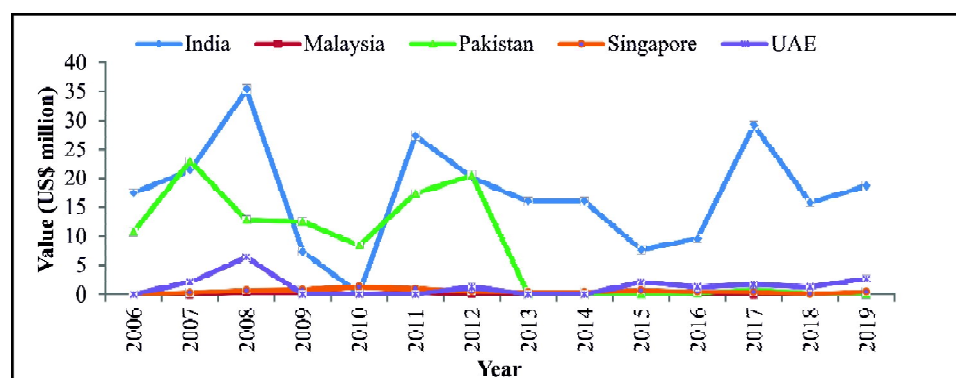


Figure 8: Myanmar's export of chickpea to major destination countries (value)

3.2.3. Growth rate of chickpea export and import from India

To ascertain the growth rate, data for exports and imports of chickpea in India from 1988 to 2019 are used where the period is divided into (1) 1988-1998 (2) 1998-2008 (3) 2008-2019 and (4), 1988-2019 (overall period). However, Myanmar export data from 1988 to 2000 was not available; hence couldn't be collected due to some limitations in obtaining published data. Therefore, the growth rate of Myanmar is estimated only from 2001 to 2019. The results of India's compound annual growth rate in terms of export and import are shown in Table 6. The fluctuation in the number of exports can be seen clearly at the beginning from 1988 to 1998 where the growth rate of chickpea export showed a decreasing growth rate of -38.82 percent. The growth rate of chickpea export increased in the next period (79.33%). CAGR of exported quantity decreased in the last period (2008-2019). The overall period showed 26.94 percent in volume and 31 percent in value.

The increase in quantity imports can be witnessed from 1988 to 1998 when imports decreased at a rate of -1.12 percent in the first period (1988-1998). In this decade, the growth rate of chickpea was declining (-1.12%). The growth rate of chickpea declined after the 1990s due to three major factors [6]: 1) Asia was facing an economic crisis at the time. A large number of Asian countries depreciated their currencies. The debt-to-GDP ratio in four key ASEAN economies increased from 100 percent to 167 percent 2) The Green Revolution of the 1960s was yielding fruit in India as a result of increased local production as a result of reduced demand for pulse imports during this period 3) Pulse prices reduced as a result of increased domestic output. The growth rate of imported quantity and value showed increasing was 1998-2008 period had the highest growth rate (15.97 % in volume and 21.88% in value) and again decreased in the next period (2008-2019). It could be inferred that the growth rate of the exported value showed higher than the quantity exported whether decreased or increased. Again, the unit price of exported chickpea has consistently risen during the study period. Compared to the exported value of pulses from other countries in the global market, the unit price of Myanmar, Australia, and Canada for exported pulses was cheaper than India. CAGR of chickpea in terms of quantity and value were highly significant in all the periods whether export or import.

3.2.4. Growth rate of chickpea export from Myanmar

Table 7 indicates the rate of exported quantity and value from Myanmar during the year 2001 to 2019. growth of exported quantity from Myanmar was found to be decreased from -4.4 percent in 2001-2010 to -0.52 percent in 2010-2019. However, the exported value showed very high in 2001-2010

Table 6: Compound annual growth rate of chickpea export and import from India

(Percent)

Period	Export		Import	
	Quantity	Value	Quantity	Value
1988-1998	-38.82*	-41.29*	-1.12*	-0.46*
1998-2008	79.33*	94.14*	15.97*	21.88*
2008-2019	1.04*	2.42*	10.68*	12.32*
1988-2019	26.94*	31.00*	7.04*	9.58*

Source: UN COMTRADE database, * Significant at 1% level of significance

(7.67%) and declined in 2010-2019 (-0.83%). The overall period depicted the growth rate performance of -4.95 percent in exported quantities and 1.18 percent in exported value. It is also interesting to note that the growth rate of exported value in the first period and overall period was higher than that of exported volume except in 2010-2019. The growth rate of exported quantity and value was found highly significant in period-I and period II while that of exported quantity and value of the overall period was found to be significant.

Table 7: Compound annual growth rate of chickpea export from Myanmar

(Percent)

Period	Quantity	Value
2001-2010	-4.4*	7.67*
2010-2019	-0.52**	-0.83**
2001-2019	-4.95**	1.18**

Source: CSO (Myanmar) and APEDA

* Significant at 1% level of significance, ** Significant at 5% level of significance

4. CONCLUSION

India is the world's largest chickpea producer, accounting for 70 percent (22,076 thousand tons) of the total chickpea production. Myanmar is the third leading country in the world with a 3.25 percent share. The trend analysis revealed that the area cultivated with chickpea increased after the 2000s in both countries. Remarkable progress has been made in chickpea production with the expansion of the area in the past two decades.

Another issue of concern in chickpea production is the yield gap between India and Myanmar. This is evidenced by the fact that production in Myanmar increased due to improvement in productivity while in India it was due to expansion in area and yield. The diversion of chickpea cultivation from the northern region to the southern region was one of the reasons for the lowest

yield and declining acreage during and after the Green Revolution in India. In the case of Myanmar, the economy was subject to a centrally planned system known as the Burmese way of socialism. It entailed taxation and control of the agricultural sector through mandatory government acquisition of agricultural products at a fraction of market prices, significant restrictions on local trade, and restrictions on the selection of crops for farmers.

After the 2000s, the area, production, and productivity of chickpea increased in both countries. This was due to the development of improved cultivars with high yield, short life, drought tolerance, and disease resistance of chickpea. Yield has greatly improved which is a possible result of ongoing research efforts by international organizations, ICARDA, ICRISAT, national research, and education programs. In Myanmar, the adoption of improved cultivars and improved crop production practices led to a marked increase in chickpea yields and production. The recent progress made in developing and adopting improved varieties of chickpea in Myanmar has been very encouraging. Approximately 80 percent of the chickpea area in Myanmar during 2013-2017 was covered by ICRISAT-bred chickpea cultivars [3].

Chickpea has a thin and volatile market. A continuous increase in demand for chickpea in India has led to an increase in imports. The demand for chickpea caused by population and income growth in India has led some developed countries to increase their domestic production to capture these markets. Therefore, it is time for developing countries like Myanmar to realize the huge potential of chickpea in increasing soil fertility and nutrition and take steps to increase productivity and thus chickpea production. The adoption of new varieties and modern agricultural practices in both traditional chickpea growing countries such as India and new chickpea producing countries such as Myanmar has accelerated chickpea production growth. In India, production expansion is expected to continue to meet the increasing demand. Moreover, export has contributed significantly to international markets.

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