

12 Production, Marketing, and Economics of Ginger

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Ginger is an important commercial crop grown for its aromatic rhizomes, which are used both as a spice and for medicinal purposes. India accounts for about 30% followed by China (20%) in total world production. The world production is approximately 0.75 to 0.8 million tons of ginger from an area of around 0.3 million hectares (Table 12.1). During the same period, the export was around 20% of total world production valued at US \$105.73 million. Even though India is the largest producer of ginger in the world, it occupied only the seventh position in export during 1999 and 2000; after China, Thailand, Brazil, Taiwan, Nigeria, and Indonesia. The major importing countries are the United Kingdom, United States, Japan, and Saudi Arabia.

Table 12.1 Production in major ginger-producing countries (1998–2000) (Area: Ha, Production: tons)

Country	Area	%	Production	%
Traditional	14,5344	45.84	650,330	84.37
Bangladesh	6,879	2.17	38,000	4.93
China	13,200	4.16	160,000	20.76
Dominica	45	0.01	100	0.01
Dominican Republic	400	0.13	1,500	0.19
Fiji Islands	65	0.02	2,500	0.32
India	83,220	26.25	281,160	36.48
Jamaica	180	0.06	620	0.08
Korea	4,255	1.34	7,950	1.03
Malaysia	1,000	0.32	2,500	0.32
Nigeria	17,400	5.49	90,000	11.68
Philippines	4,700	1.48	28,000	3.63
Sri Lanka	2,000	0.63	8,000	1.04
Thailand	12,000	3.78	30,000	3.89
Newcomers	15,261	4.81	12,4948	16.21
Australia (1990)	150	0.05	4,500	0.58
Bhutan (1980)	350	0.11	3,100	0.40
Cameroon	1,370	0.43	7,500	0.97
Costa Rica	1,600	0.50	21,000	2.72
Ethiopia (1993)	150	0.05	400	0.05
Ghana	0.00	60	0.01	
Indonesia (1981)	10,000	3.15	77,500	10.05

Table 12.1 (Continued)

<i>(Area: Ha, Production: tons)</i>				
Country	Area	%	Production	%
Kenya (1989)	55	0.02	150	0.02
Madagascar (1992)	8	0.00	30	0.00
Mauritius (1985)	70	0.02	200	0.03
Nepal (1985)	1,200	0.38	3,200	0.42
Pakistan (1994)	78	0.02	28	0.00
Reunion (1985)	30	0.01	500	0.06
Saint Lucia (1985)	25	0.01	60	0.01
Uganda (1990)	50	0.02	120	0.02
United States (1985)	125	0.04	6,500	0.84
Zambia	0.00	100	0.01	
World	31,7055	100.00	770,778	100.00

Source: FAO (2003) (figures in parentheses indicate earliest year of initiating production).

Major ginger growing states in India are Kerala, Meghalaya, Orissa, West Bengal, Andhra Pradesh, Karnataka, Sikkim, and Himachal Pradesh. Official statistics on area, production, and productivity, although conflicting, are available through FAOSTAT (statistical data base of FAO) and SPICESTAT (Spices Statistical database of the Integrated National Agricultural Resources Information system [INARIS] of the Indian Council of Agricultural Research, India located at the Indian Institute of Spices Research, Calcut, Kerala, India). However, the trade-related figures available are comparatively complete and make a distinction between dried and fresh ginger. A multitude of processed ginger products entering into the world market are not taken into account separately. Despite certain limitations in the availability, this chapter makes use of the time series data obtained from the FAO and other agencies to analyze the trend in countrywise area, production, export, and import. The aim of this effort is to get some broad indications on the possible changes that have taken place in the crop economy during the last three decades since 1970–1971 and further prospects based on observed trends.

Production

World Scenario

Table 12.2 shows the growth of ginger production during the past 25 years for major producing countries. During 1975 through the 1980s, India was the major producer of ginger with a 30 to 35% share in total world production, followed by China, which accounted for approximately 15%. China could have increased its share in the world production from 12% in 1975 to over 24% in the recent past. China (24%), India (28%) and Indonesia (15%) are the top three producers, accounting for about two-thirds of the total world production.

The supply of ginger on a countrywise basis is computed by looking at area, production, and exports. The analysis brings out inconsistencies in yield and area expansion than to go deep into the factors responsible for the changes. In order to make a meaningful analysis, ginger-producing countries are grouped into two major categories: traditional producers and newcomers. The groupings suggest that up to 1980 there were about 15

Table 12.2 Production in major ginger-producing countries (1975–2002)

Period	% Share in total by				World production (Mt)
	India	China	Indonesia	Others	
1975	30.67	11.68	—	57.65	147,213
1980	33.47	20.75	—	45.78	246,316
1985	35.37	12.89	12.56	39.18	390,259
1990	31.35	11.05	16.27	41.33	491,153
1995	30.11	20.00	11.34	38.55	728,376
2000	28.58	23.70	15.52	32.20	962,060
2002	27.83	23.98	15.18	33.01	988,182

Source: FAO (2003).

countries engaged in the production of ginger. Since ginger cultivation and processing is labor intensive, most of the African countries have neglected this crop, and consequently they are not very active now in the world market. However, many other countries have entered into the field, and the number has almost doubled to date. The average share of newcomers in total production during the recent past (1998 to 2001) is 16.21%, and is rapidly increasing. Among the newcomers, Indonesia, which started production around 1981, accounts for about 10% of total world production, but the share of other newcomers was not that significant (6.2%) during the same period. However, it is a fact that many new countries are becoming interested in the production of ginger, and many have entered into the production arena during the last 5 to 6 years (Datta et al., 2003).

Area Expansion

An analysis of world scenario for growth in terms of acreage under ginger reveals:

- China recorded the highest growth in acreage during 1991 to 2002 (10.969%) among all ginger-producing countries. Indonesia and India, the other major producers, to show a moderate growth of 5.6% and 3.06%, respectively, during the same period.
- Other countries showing considerable growth in land under ginger during this period are Sri Lanka (0.26%), the United States (5.92%), Costa Rica (7.57%), Mauritius (1.31%), Bangladesh (1.34%), and Nigeria (5.8%). On the other hand, countries like Uganda (−20.35%), Fiji (−8.29%), Pakistan (−13%), and Jamaica (−10.41%) have experienced a rapid decline in acreage during this period. Most of these countries were newcomers.
- The Philippines (−3.35%), Nepal (−3.35%), are Thailand (−4.69%) are the other countries to record comparatively less decline in acreage.
- An interesting phenomenon observed in terms of fluctuations in growth in acreage is that a high growth in area in a particular period for a country is generally followed or preceded by a period of low and negative growth.
- There is no striking difference between performances of traditional growers and newcomers. In terms of growth in acreage, some newcomers have fared well, whereas some have failed badly. The same argument holds true in respect to the traditional ginger-producing countries as well.

Growth in Production

The world scenario in terms of growth in production highlights the following recent trends (Datta et al., 2003):

- China recorded the highest growth (11.39%) during 1991 to 1997, followed by Mauritius (11.15%) and Kenya (9.95%). The next in order are Nigeria (8.56%), Malaysia and Sri Lanka (both 6.78%), Madagascar (5.96%), and South Korea (4.36%).
- On the other hand, a number of countries have recorded a high negative growth. Uganda experienced the highest (-21.67%), followed by Fiji (-17.24%).
- In between these two extremes lie the rest, some showing moderate positive and the others showing moderate negative average growth.

As regards growth, the cyclical nature of the growth pattern was observed over the decades for both area and production. Barring Fiji, the nature of fluctuations in acreage and production was almost identical (in terms of both peak and trough) for other countries. Again, as in acreage, the growth pattern in production is also not group specific.

Yield

In terms of productivity performance, the world scenario gives the following picture:

- Barring Fiji, South Korea, the Philippines, and Nigeria, the traditional growers of ginger, cyclical fluctuations are not that sharp in other countries.
- The fluctuations are highly erratic in Fiji, recording a high negative growth during 1971 to 1980 and a very high positive growth in the next decade, only to come down to around 3% in 1991 to 1997.

In order to analyze the salient features of major ginger-producing and ginger-consuming countries individually, an effort is made to present countrywise details separately.

India

Ginger is grown in almost all the states of India. However, major ginger-producing states are Kerala, Orissa, Meghalaya, West Bengal, Karnataka, Sikkim, Andhra Pradesh, and Himachal Pradesh. Kerala accounts for the major share of both area (19%) and production (19%) of ginger in India. This figure has remained more or less unchanged over the last three decades. Orissa state stands second followed by Meghalaya. These three traditional ginger-growing regions of the country account for nearly 40% of the total production in the country.

In south India, although ginger cultivation was confined mostly to Kerala in the earlier years, during the last 8 to 10 years it is making fast inroads in to the paddy fields of Karnataka and Tamil Nadu. In Karnataka commercial cultivation of ginger is picking up in the districts of Coorg and Chikmagalur, with a reported area of approximately 4,500 hectares. Korikanthimath and Govardhan (2001a, b) claims that in the Kodagu district of the state alone nearly 4,000 hectares of paddy land has been converted for

cultivation of ginger. Enterprising farmers from the adjacent Waynad district of Kerala lease paddy fields for cultivation of ginger. Fresh ginger harvested during the months of January to March had buyers from Nagpur, Mumbai, and Bangalore. A sizeable quantity of fresh ginger goes to the traditional ginger-growing districts of Ernakulam and Kottayam in Kerala for further processing into dry ginger. In Kerala, the Waynad and Idukki districts contribute the most toward the export of quality ginger from the state. Incidentally, these two districts have the maximum production density for ginger in the country.

Karnataka farmers sometimes have a practice of putting back a certain portion of the year's ginger crop in the ground and preserve it as "old ginger" for the next year. The reason for this is the low price in the market at the time of harvest. During the next season, this same old ginger will grow further. More rhizomes will develop, and farmers hope that at that time they will get a better price for both the old ginger and the new rhizomes. Himachal, Maran, and Rio de Janeiro are the major cultivars grown in the region (Spices Board, 1988).

Production Economics

Examination of time series data indicates that the coefficient of variation for the farm price of ginger was higher than that of production over a period, indicating the violent fluctuation in the price of ginger in the country. This fluctuating prospect had a greater impact on the production economics of the farming community. The problem can be better understood from the fact that farmers buy seed rhizomes for prices as high as Rs.50/kg at times, but their harvested crop could fetch them only less than one-fifth of this price. In order to avoid the price-related risk, the farmer cultivates ginger as an intercrop under various cropping systems, although a pure crop is not uncommon. In the major ginger-growing state of Kerala, nearly one-fourth of the cultivated area is in the uplands as pure crop whereas the major area (45%) is in the garden land category and the rest is under a mixed cropping system. A study on economics found that the banana + ginger system fetched more net income of Rs.2,74,808 per hectare followed by the banana + ginger + vegetable cowpea intercropping system (Rs.1,92,578/-). The benefit-cost ratio was also highest in the banana + ginger system (2.28), whereas the lowest benefit-cost ratio (1.56) was recorded for the banana + turmeric system (Regeena and Kandaswamy, 1987). The estimated per kilogram production cost in Kerala for a pure crop of ginger during 2001 to 2002 was Rs.5.52, and it was comparatively more than that in Karnataka (Rs.3.84) owing to higher labor costs and other added costs toward chemical fertilizers (IISR, 2002). Ginger is a high-labor and input-demanding crop. A survey conducted by the Kerala Agricultural University also ascertained the fact that the Kerala farmers use large quantities of fertilizers. The share of fertilizer cost amounted to 26% in Kerala, whereas it was only 10% in Karnataka (IISR, 2002). As regards the labor requirement, the actual enumeration done to estimate the operation-wise labor requirement indicates that the ginger requires nearly 337 workdays/ha for the entire period of cultivation excluding marketing. The estimated standard cost-return budget for ginger in India is given in Table 12.3, which also reflects the fact that more than 65% of the total cost incurred is toward labor and seed material purchase. It can be further observed that the ginger farmer gets a marginal benefit, which can be wiped out easily due to unexpected losses in production and a slight fall in price. However, there exists a comparatively higher benefit-cost ratio when the marketed end product is dry gingers.

Table 12.3 Cost-return budget for ginger (Rs./ha)

SI No.	Description	Input/ha	Value Rs.	% share	Owner/tenant share	% cost
1	Unpaid labor (man days)	67.0	—			
	Unpaid (Rs. Per day)	80.00	—			
	Unpaid labor Cost>		5,360.00	5.49		
2	Hired Labor (man days)	270.0	—			
	Cost (Rs./day)	80.00	—			
3	Hired labor Cost>		21,600.00	22.13		
	Seed material (kgs)	1,600.0	—		Fertilizer	100.0
	Cost (Rs./kg)	22.50	—		Bought seed	100.0
4	Seed ginger purchase Cost>		36,000.00	36.88	Fertilizer and manure	100.0
	Own material	0.0	—		Mulch	100.0
	Own material (Rs./kg)	0.00	—		Plant protection	100.0
	Own material Cost>		0.00			
5	Manure/compost (Mt)	20.0	12,000.00		Fertilizer	Cost (Rs./unit)
	Chemical fertilizer N (kgs)	60.0	782.00			
	Chemical fertilizer P (kgs)	50.0	978.00		Manure/compost	600.00
	Chemical fertilizer K (kgs)	120.0	370.00		N	13.03
	Mulching material (Mt.)	20.00	4,000.00		P	19.56
6	Total fertilizer & mulch Cost>		18,130.00	18.57	K	3.08
	Chemical	2.40	—			
7	Seed treatment cost (Rs./kg)	380.00	—			
	Seed treatment (Rs./ha) Cost>		912.00	0.93		
	Plant protection (nos)	4.00	—		Interest rate	11%
8	Plant protection (Rs./spray)	2,000.00	—			
	Plant protection (Rs./ha) Cost>		8,000.00	8.20		
	Irrigation (Rs./ha)		2,300.00			
	Miscellaneous (Rs./ha)		500.00			
	Drying		17,280.00			
9	Interest on variable Cost @11%	Costs>	4,809.31			
	Total variable costs (Rs.)		97,611.31			
	Total production cost Rs. (fresh)		97,611.31	100.00	Return for fresh ginger:	
Returns over variable	Costs (Rs.)	12,388.69		Yield (t/ha)	20.0	

Returns over total	Costs (Rs.)	12,388.69	Price/t	5,500.00
Variable cost per	t	4,880.57	Gross income (Rs.)	110,000.00
Total cost per Mt	(Rs.)	4,880.57	Production (t)	20.00
Breakeven yield Mt at Rs.	5500.00	17.7		
Benefit-cost ratio	1.13			
Total production cost Rs. (dry)		114891.31	Return for dry ginger:	
Returns over variable Costs	(Rs.)	53109.00	Yield (t/ha)	3.2
Variable cost per	t	35,903.44	Price/t (Rs.)	52,500.00
Total cost per Mt	(Rs.)	35,903.44	Gross income (Rs.)	168,000.00
Benefit-cost ratio	1.46			

N, nitrogen; P, phosphorus; K, potassium.

A study conducted in Maharashtra to work out the economics of ginger production revealed that the average production cost per quintal (100 kg) was Rs. 1,012.04 and the estimated cost-benefit ratio was 1.38 for cost. Here also the cost of seed rhizome has eaten up almost 42.6% of the total costs involved in ginger production (Gaikwad et al., 1998).

Korikanthimath and Govardhan (2001b) conducted a study to compare the economics of cultivation of ginger in uplands and paddy fields of Karnataka, which indicated that the cost-benefit ratio is more favorable in paddy fields (1.7) when compared to upland cultivation (1.11). This higher profitability is mainly due to higher productivity (23.5 t/ha) achieved in the paddy fields when compared to the yield level of 13.5 t/ha in the upland.

Trends in Area, Production, and Productivity

The time series data on area, production, and productivity of ginger along with the growth index worked out for the period from 1970 to 2000 are presented in Table 12.4 and Figure 12.1. A perusal of the period-wise performance indicates a significant increase in production over the years.

Area: The area under ginger has shown an increasing trend over the years from 1970 to 2000, with occasional fluctuations being attributed to the ups and downs in price. Low remuneration in a year owing to an unfavorable price generally leads to a reduction in area and production in subsequent years.

Production: Indian production of ginger has been increasing steadily from 29.59 thousand tons in 1970 to 1971 to 263.17 thousand tons during 1999–2000. An increase of nearly 789% in production is due to the combined improvement in both area and productivity. The states Meghalaya and Kerala together accounted for more than 65% of total production in the country. If we make a region-wise grouping, the southern

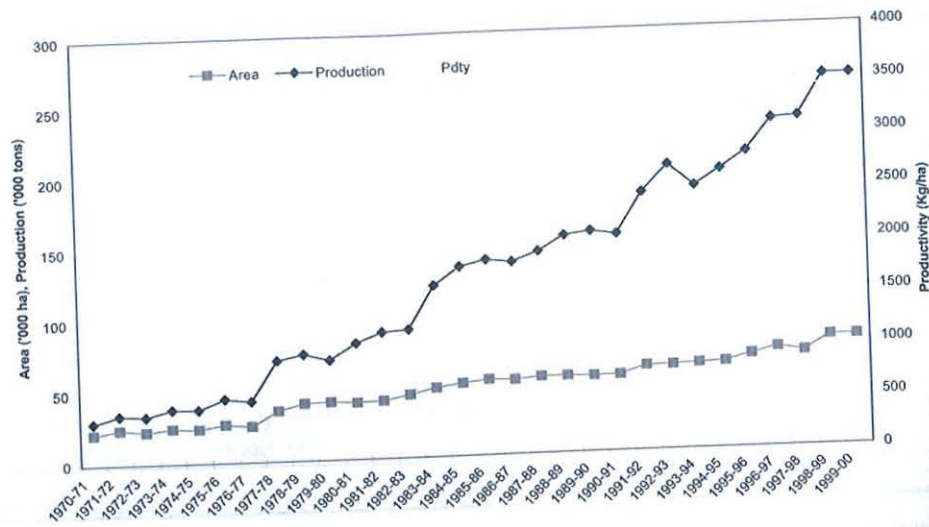


Figure 12.1 Area production, and productivity of ginger in India (1970–1971 to 1999–2000).

Table 12.4 Area, production, and average yield per hectare of ginger (dry) in India

Year	Area ('000 ha)	Growth index	Production ('000 tons)	Growth index	Yield (kg/ha)	Growth index
1970–71	21.59	53.37	29.59	35.89	1371	100
1971–72	24.59	60.79	34.71	42.10	1412	102.99
1972–73	22.88	56.56	33.63	40.79	1470	107.22
1973–74	24.86	61.46	38.46	46.65	1547	112.84
1974–75	24.14	59.68	37.91	45.98	1573	114.73
1975–76	27.2	67.24	45.15	54.77	1660	121.08
1976–77	25.65	63.41	43.39	52.63	1691	123.34
1977–78	36.02	89.05	71.7	86.97	1991	145.22
1978–79	40.8	100.87	75.72	91.85	1856	135.38
1979–80	41.42	102.40	71.14	86.29	1717	125.24
1980–81	40.45	100.00	82.44	100.00	2038	148.65
1981–82	41.11	101.63	89.71	108.82	2182	159.15
1982–83	44.72	110.56	90.83	110.18	2031	148.14
1983–84	48.96	121.04	121.31	147.15	2478	180.74
1984–85	51.51	127.34	133.86	162.37	2599	189.57
1985–86	53.52	132.31	138.02	167.42	2579	188.11
1986–87	52.65	130.16	136.01	164.98	2583	188.40
1987–88	54.24	134.09	142.84	173.27	2633	192.05
1988–89	54.23	134.07	153.57	186.28	2832	206.56
1989–90	53.56	132.41	156.12	189.37	2915	212.62
1990–91	53.93	133.33	153.45	186.14	2845	207.51
1991–92	59.83	147.91	182.65	221.56	3053	222.68
1992–93	59.87	148.01	201.63	244.58	3368	245.66
1993–94	60.58	149.77	186.2	225.86	3074	224.22

1994–95	61.09	151.03	197.65	239.75	3235	235.96
1995–96	65.98	163.11	209.88	254.59	3279	239.17
1996–97	70.29	173.77	232.51	282.04	3308	241.28
1997–98	67.2	166.13	233.66	283.43	3477	253.61
1998–99	77.61	191.87	263.17	319.23	3391	247.34
1999–2000	77.61	191.87	263.17	319.23	3391	247.33

region, comprising Tamil Nadu, Kerala, Karnataka, and Andhra Pradesh, accounts for 52.4% of production with a 42.4% area during 1990 to 1991 to 2000 to 2001. Distribution of the ginger-producing area as a percentage of the total cropped area and production (district-wise) worked out clearly indicates the concentration of ginger cultivation in the states of Kerala and Meghalaya and their dominance in ginger production in the country.

The state-wise area, production, and productivity of ginger for three periods—1982 to 1983, 1992 to 1993, and 1998 to 1999—are given in Table 12.5. As it can be seen from Table 12.5, against the national average yield of around 3,371 kg/ha achieved during 1992 to 1993, states such as Meghalaya, Andhra Pradesh, Sikkim, and Tamil Nadu have been consistently recording a higher level of yield. Tamil Nadu achieved the highest yield of 19,450 kg/ha during the period and has attained a record productivity

Table 12.5 Statewise area, production, and productivity of ginger in India (Area: '000 ha, Production: '000 tons, Productivity: kg/ha)

States		1982 to 1983			1992 to 1993			1998 to 1999		
		Area	Production	Productivity	Area	Production	Productivity	Area	Production	Productivity
Kerala	Actual	12.36	30.48	2466	15.34	50.39	3285	14.57	49.95	3428
	%	27.64	33.56	25.64	24.98	18.77	18.98			
Meghalaya	Actual	5.82	24.05	4132	6.64	40.8	6145	9.55	49.06	5137
	%	13.01	26.48	11.10	20.23	12.31	18.64			
Orissa	Actual	5.44	5.41	994	9.54	14.28	1489	13.52	26.91	1990
	%	12.16	5.96	15.95	7.08	17.42	10.23			
West Bengal	Actual	3.15	4.97	1577	6.86	12.76	1860	9.4	18.84	2004
	%	7.04	5.47	11.47	6.33	12.11	7.16			
Sikkim	Actual	3.04	5.88	1934	3.54	19.14	5407	2.49	4.32	1735
	%	6.80	6.47	5.92	9.49	3.21	1.64			
Karnataka	Actual	2.38	3.1	1302	2.13	2.81	1319	3.94	5.26	1335
	%	5.32	3.41	3.56	1.39	5.08	2.00			
Andhra Pradesh	Actual	2	3.5	1750	2.06	7.27	3529	1.91	6.77	3545
	%	4.47	3.85	3.44	3.60	2.46	2.57			
Himachal Pradesh	Actual	1.9	0.48	252	1.64	1.2	732	1.81	0.87	481
	%	4.25	0.53	2.74	0.59	2.33	0.33			
Tamil Nadu	Actual	—	—	—	0.90	16.10	17889	0.58	18.22	31414
	%	—	—	—	—	—	—			
Others	Actual	8.63	12.96	1100.85	12.07	53.08	3127.07	20.42	101.19	5336.5
	%	19.30	14.27	20.18						
All India	—	—	—	59.82	201.63	3371	75.57	252.00	3366	

Source: DASD (Directorate of Arecanut and Spices Development) (2002), Government of India, Calicut, India; DES (Directorate of Economics and Statistics) (2001), New Delhi, India.

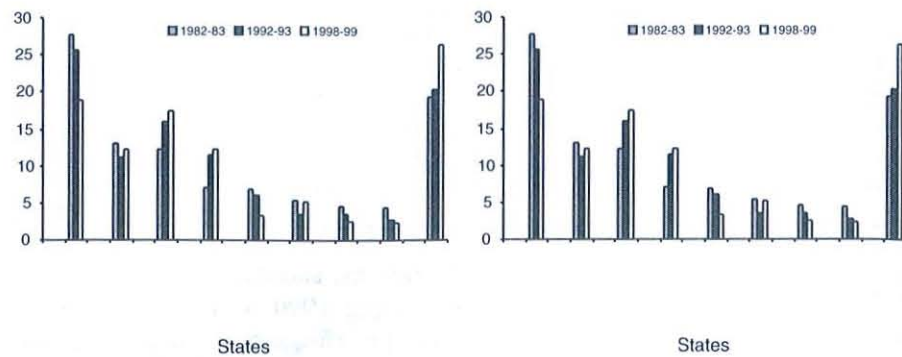


Figure 12.2 Area production, and productivity of ginger in India (1970–1971 to 1999–2000).

of 31,683 kg/ha during the 1998 to 1999 crop year. The insignificant change in area in Tamil Nadu is taken care of by a significant growth in yield in the state, thereby helping it to register a healthy growth in production. Nagaland, Mizoram, Arunachal Pradesh, and Meghalaya are the other states in the order of achieving higher productivity (more than 5,500 kg/ha) during the same period. Arunachal Pradesh registered 7,164 kg/ha, Meghalaya, 5,137 kg/ha, Mizoram 5,000 kg/ha; while Orissa registered the lowest figures (1,990 kg/ha) (DASD, 2002).

Productivity: Further analysis of the time series data between the period 1970 and 1971 to 1997 and 1998 indicated that the yield level of ginger in the country increased over the years from 1,371 kg/ha during 1970 to 1971 to 3,391 kg/ha during 1997 to 1998. The yield level that was approximately 1,371 kg/ha during 1970 to 1971, did not show much improvement until the end of 1980 except for occasional fluctuations toward the higher side (up to 1,991 kg/ha during 1977 to 1978), it seems that the yield increase during this period did not contribute much to the increase in production. The increase in production during that period was largely due to an increase in cropped area. However, the productivity level improved from 1980 to 1981 onward and reached an average of 3,188 kg/ha during 1990 to 1991 to 1998 to 1999. Productivity registered during 2000 to 2001 was more than two times the productivity of 1970 to 1971. The estimated growth index for the year 1998 to 1999 in production was 254 percent over the base year (1970 to 1971).

To ascertain the impact of area expansion and productivity on production during different periods, periodwise data were analyzed using a simple technique followed by Librero et al. (1988). Results presented in Table 12.6 show that there is a positive sign in all the three parameters indicating the steady improvement in production due to both area expansion and productivity increase. However, the detailed component analysis reveals that the change in productivity had a more positive role in the first two periods, whereas in the last period area expansion played a major role in production expansion.

Growth Estimates: In order to obtain the long-term trends in area, production and productivity in major ginger-producing states in India, semilogarithmic growth equations were estimated, which indicated that the overall trend in area under ginger registered an average annual growth of 4.3% for the period from 1990 to 1999. Growth

Table 12.6 Change in ginger production, area, and the relative contribution of changes in area and yield on the change in production for selected periods

	1980–1981/ 1984–1985 to 1985–1986/ 1989–1990	1985–1986/ 1989–1990 to 1990–1991/ 1994–1995	1990–1991/ 1994–1995 to 1995–1996/ 1999–2000
Change in:			
Production	40.22	26.84	30.47
Area	18.28	10.10	21.47
Productivity	19.54	15.01	8.16
Change in production due to change in:			
Area	49.66	40.48	73.11
Productivity	52.81	58.83	29.49

Note: Analysis based on the method followed by Librero et al. (1988).

in production was at the rate of 6.11% during the same period, indicating a slight improvement in productivity, which was approximately 1.82% for the period.

Production Constraints

A status paper prepared by the Spices Board (1990) on the ginger crop highlights the fact that mostly small and marginal growers cultivate ginger in India. They face many problems and constraints that hamper the productivity of ginger. Major production constraints in ginger cultivation as given by various workers including the Spices Board of India (Kithu, 2003; Sarma and Jackson, 2003; Selvan and Thomas, 2003) are:

1. Low productivity (3,391 kg/ha) compared to an achieved average productivity of more than 1 lakh kg/ha elsewhere in the world.
2. Prevalence of an innumerable number of traditional cultivars, which are mostly poor yielders. Absence of an adequate supply of quality planting materials of improved cultivars.
3. Being a predominantly rain-fed crop, failure of rains and increased labor costs are some of the factors responsible for the higher cost of cultivation of ginger in India.
4. Nonadoption of integrated plant protection measures to control pests and diseases such as rhizome rot causes heavy production and postharvest losses in the crop in many parts of the country.
5. Lack of suitable postharvest processing for ginger rhizomes and poor marketing facilities, especially in the northeastern states of the country, results in poor returns to the farming community.
6. Lack of remunerative prices in subsequent years leads to less enthusiasm to cultivate ginger or leads to neglect of the crop.

Keeping the above facts in mind, there is an urgent need to develop cropping systems with ginger as a component. Although it is being cultivated as an intercrop in coconut

and arecanut plantations, we are yet to develop ideal systems with attention to the cost–benefit factor, soil disturbance, shade and root effect, and other factors.

China

In China, ginger is grown extensively in all central and southern provinces. It is cultivated as an annual or as a perennial crop. China emerged as the second largest producer of ginger during the year 2002 (23.98% of the world production) after India. During 1990, China's production was 54,284 tons, accounting for 11.05% of the total world production. Within 10 years time the production level has increased more than four times to account for nearly one-fourth of the world production. This achievement is mainly because of the high productivity of 115,104 kg/ha, and the highest recorded level (120,641 kg/ha) was in 1996.

In international trade China also enjoys the first position due to the quality of Chinese ginger; less fiber content, bigger size, and price competitiveness. China occupied first position in exporting ginger from 1994 (52.05% of total exports) until 2000, accounting for 61.59% of the total world exports. Chinese exports accounts for 61% of the annual imports of more than 91,000 tons by Japan. Other importing countries also prefer Chinese ginger for its cheap price and acceptable quality parameters.

Ginger is also exported in crystallized form in earthenware jugs and in syrup in wooden kegs. Harvesting of ginger in China starts in April and extends into June. Harvested young ginger is transported to processing plants in Chiang Rai for export; mostly to Japan. Young ginger is preserved in bottles of vinegar and eaten like pickles.

Australia

Commercial cultivation of ginger in Australia was first started at Buderim in southeast Queensland in the early 1940s, mainly for the domestic fresh ginger market. Ginger is now grown in the Caboolture, Nambour, and Gympie areas for processing at Yandina. Twenty-four growers currently represent the Australian ginger industry with approximately 150 ha under cultivation. The bulk of production is processed, with smaller volumes being sold on the domestic and exports markets. Buderim Ginger Ltd. is the only ginger-processing facility in Australia. This factory, through production quotas and a differential pricing system, controls the quality and quantity of ginger production for processing. Most growers derive the majority of their income from processed ginger. A few also supply the domestic fresh ginger market, and only two to three growers export fresh product. In 1987, Royal Pacific Foods began exporting Buderim ginger to the United States. Now the Australian products under the brand name "the Ginger People," are freely available on the shelves of many well-known food chain stores the world over. The Australian ginger farmer has achieved a reasonably higher productivity against the world average (Table 12.7).

Table 12.7 Ginger yield in Australia

Harvest	Time of harvest	Yield t/ha
Early	Late Feb.–early March	12–50
Early-late	April–Aug.	20–50
Late-late	Mid Jun–Early Oct.	38–75

Thailand

Thailand's agriculture sector produces about 32,000 tons of ginger in a year. The crop is cultivated extensively in the northern part of the country, especially in the mountains. Ninety percent of the production comes from the hills. Thailand had a slow increase in production over the period. Without much improvement in the recorded productivity of 25,000 kg/ha, improvement in the overall production was achieved through area expansion. The estimated normal growth rate for the period 1990 to 2002 was 2.7%, 2.81%, and 0.10%, respectively, for area, production and productivity.

Ginger from Thailand is noticeably distinguishable from other ginger by its plumpness, roundness, and short internodes. The dried "Golden" ginger is packed and exported.

Marketing

Products of Commerce

Three primary products of ginger rhizome are traded in the world market: fresh ginger, preserved ginger in syrup or brine, and dried ginger. Preserved ginger is prepared from the immature rhizome, whereas the pungent and aromatic dried spice is prepared from harvesting and drying the mature rhizome. Fresh ginger, consumed as a vegetable, is harvested both when immature and mature. The preserved and dried products are the major forms in which ginger is internationally traded. Fresh ginger is of less importance in international trade, but this is the major form in which ginger is consumed in the producing countries. Dried ginger is used directly as a spice and also for the preparation of its extractives—ginger oleoresin and ginger oil (ITC, 1995).

Commercial ginger in India is graded according to the region of production, number of fingers contained in the rhizome, size, color, and fiber content. In Indian states such as Himachal Pradesh, grading of ginger is done only in the state. The first grade, popularly known as "Gola" in the local market, comprises very bold and round bits of dry ginger, having maximum dry matter and low fiber contents. The second grade, known as "Gatti," includes bits of bold, round to oblong pieces, which are smaller than gola. The third and fourth grades are smaller bits having low dry matter and high fiber contents (Jaiswal, 1980). For export purposes, Calicut and Cochin ginger are graded into special, good, and nonspecial grades depending on the size of the rhizomes and the percentage of the presence of extraneous material.

Dried ginger has been traditionally traded internationally in the whole or split forms and is ground in the consuming centers. Export of the ground spice from the producing countries is on an extremely small scale. The major use of ground dried ginger on a worldwide basis is for domestic culinary purposes, whereas in the industrialized Western countries it also finds extensive use in the flavoring of processed foods. Ground dried ginger is employed in a wide range of foodstuffs, especially in bakery products and desserts (Anonymous, 1996).

Ginger oleoresin, an important value-added product, is obtained by solvent extraction of dried ginger and is prepared both in certain industrialized Western countries as well as in some of the spice-producing countries; most notably in Australia and India. This product possesses the full organoleptic properties of the spice—aroma, flavor, and pungency—and finds similar applications to those of the ground spice in the flavoring of processed foods. The oleoresin is also used in certain beverages and to a limited extent in pharmaceutical preparations. The new process developed by the Regional Research

Laboratory, Trivandrum, for extracting oil and oleoresin from fresh ginger, will lead to a higher recovery of the oil with superior organoleptic qualities, and will drastically reduce spoilage of fresh ginger during the harvesting season. This technology, which is highly suitable for the northeastern states, can utilize the cheap raw material available during the harvesting season to convert it into high-priced value-added products. The operating cost of a fresh ginger-processing facility is much lower than that for a conventional plant. Further, drying, peeling, and so forth are dispensed with, and since the processing is done during the ginger harvesting season, the raw material inventory can be reduced drastically. It is expected that adoption of this new technology can boost the country's prospects in adding value to the export basket of Indian ginger.

Ginger oil is distilled from the dried spice mainly in the major spice-importing countries of Western Europe and North America, as well as in some of the spice-producing countries such as India. This product possesses the aroma and flavor of the spice but lacks the pungency. It finds its main application in the flavoring of beverages and it is also used in confectionery and perfumery. Preserved ginger is prepared mainly in China, Hong Kong, Australia, and India, but smaller quantities of fresh ginger are processed in some importing countries too. It is used both for domestic culinary purposes and in the manufacture of processed foods such as jams, marmalades, cakes, and confectioneries (Sreekumar and Arumughan, 2003).

Market Structure

Regarding the market structure, there are a number of firms and individuals actively participating in the ginger trade especially in the case of dried ginger. A large number of dealers, brokers, and various other intermediaries between the dealer and the user or even between the dealer and the dealer exist both in exporting and importing countries. Singapore, London, New York, Hamburg, and Rotterdam are major trading centers. In the case of preserved ginger, Hong Kong is the major trading center. Fresh ginger is marketed through the fruits and vegetables trade network.

The prevailing marketing channel for ginger in India is seen in Figure 12.3, with slight variation between the regions. To begin with, farmers, after retaining the needed quantity for seed purposes and for domestic consumption, sell off a portion of their output to commission agents/village traders, who collect the produce at the farm gate. The produce thus collected is taken to the nearest assembly market in the taluk/block, from where it is transported to the regional/district level main marketing centers. Farmers having a large production base often take their produce to local and/or regional markets directly. Once the product reaches the regional (taluk/district) level markets, it is cleaned, graded, and then packed in sacks of about 60 kg. From here it is moved to terminal markets like Kochi, Chennai, Bombay, Bangalore, Kolkotta and New Delhi. Except in states like Kerala, where the ginger is dried and marketed for export purposes, in all other states harvested fresh ginger is marketed following the channels of vegetable marketing in the region. In some of the states fresh ginger is listed along with the vegetables covered under market regulation.

In terms of the ratio between the farm harvest price and retail price, it was observed that the ratio was higher in 1989 than in 1995. Moreover, fluctuations in the ratio were also less in 1989. The ratio between the farm harvest prices and the wholesale price has also gone down in recent years.

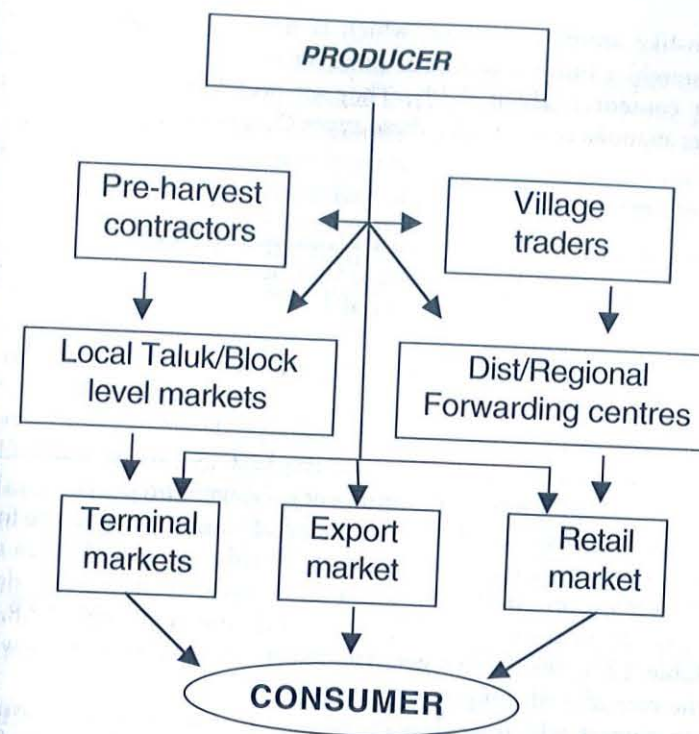


Figure 12.3 Commodity distribution system for ginger in India.

Factors of Demand/Export

Major factors that contribute to the export demand/potential of a commodity is quality. In ginger quality parameters are fiber content, volatile oil content, and nonvolatile ether extract.

Ginger grown in different parts of the country varies considerably in its intrinsic properties and its suitability for processing. This is perhaps more important with regard to preparing dried ginger than preserved ginger. The size is particularly relevant with the processing of dried ginger, and medium-sized rhizomes are generally the most suitable. Some areas grow ginger types yielding very large rhizomes, which are marketed as fresh ginger, but are unsuitable for converting to the dried spice owing to their high moisture content. This causes difficulties in drying, frequently a heavy wrinkled product is obtained, and the volatile oil content is often low and below standard requirements. From the above point of view, ginger produced in certain pockets of Kerala has more export demand/potential in the world market.

Indian Dried Ginger: Two types of Indian ginger entering the international market are Cochin and Calicut; named after the two major production areas on the Malabar Coast of Kerala. The bulk of Indian exports is of rough scraped, whole rhizomes. In addition to this, some bleached or limed ginger is also produced, but this is mainly exported to the Middle East, as it is not favored in European and North American markets. Cochin and Calicut gingers have volatile oil contents in the range of 1.9 to 2.2%. They are

characterized by a lemon-like aroma and flavor, which is more pronounced with the Calicut spice. They are starchier but are almost as pungent as Jamaican ginger. Their nonvolatile ether extract content is about 4.3%. They are widely used for blending purposes, and ginger beer manufacturers prefer these types (Spices Board, 1992).

Economics of Dried Ginger Production

In India, production of the dried ginger of commerce is confined exclusively to the state of Kerala and the product is of two types—Cochin and Calicut. The Cochin type, which is preferred over the Calicut type, is grown in central Kerala, mainly concentrated in the districts of Ernakulam and Idukki; and the Calicut is grown in the Malabar region including the Waynad district in northern Kerala. The estimated cost of production of dry ginger in Kerala is given in Table 12.8.

There is no recognized commercial variety of dried ginger produced in other parts of the country. Kerala ginger is considered to be one of the best due to its lower fiber content, boldness, and characteristic aroma and pungency. Gingers produced in other states have more fiber content, and are largely used for internal consumption in the form of green ginger. Kerala accounts for over 60% of the total dried ginger production and about 90% of India's ginger export trade. Cost and returns involved in making dried ginger following the recommended method of natural sun drying is in Table 12.8. As it can be seen from Table 12.3, the farmer gets the benefit-cost ratio of 1.46 when compared to 1.13 in the case of fresh ginger marketing.

In contrast to Jamaican gingers, which are clean peeled, Indian dried gingers are usually rough peeled or scraped. The rhizomes are peeled or scraped only on the flat sides of the hands; much of the skin between the "fingers" remains intact. The dry ginger so produced is known as the rough or unbleached ginger of commerce, and the bulk of the dried ginger produced in central Kerala consists only of this quality. Sometimes Indian gingers are exported unpeeled. For the foreign market, both Cochin and Calicut gingers are graded according to the number of "fingers" in the rhizomes: B, three fingers; C, two fingers; D, pieces. In addition to these two well-known types of Indian ginger, another type, Calcutta ginger, is occasionally seen in the market (Pruthi, 1989).

Table 12.8 Economics of dry ginger production

Sl No.	Item of expenditure	Cost (Rs.)
1.	Cost of raw fresh ginger 1000 kgs @ 5.50/kg	5,500.00
2.	Peeling: 18 persons @ Rs.80/day	1,440.00
3.	Drying: 8 workdays @ Rs.80/day	640.00
4.	Polishing and packing	960.00
5.	Gunny bags for packing	200.00
	Total cost	8,440.00
	Gross returns for 200 kg @ Rs.52.50/kg	10,500.00
	Net return	2,060.00

Source: Madan (1999).

World Scenario

As ginger is mainly used as a spice and condiment, its per capita consumption is not high enough to sustain its world level production with the growing number of new producing countries taking recourse to international trade in ginger. However, the market information indicates that there is a "hot trend" in the U.S. market, that is, an increasing demand for spices like chilies, ginger, and black pepper. There is also a growing demand for ginger and ginger products worldwide. A recent development noted in ginger trade has been the increasing use of ginger oils and oleoresins and powdered and processed ginger in major importing countries, especially in Europe and the United States.

Main Suppliers

Major exporters of dry ginger are India and China. Among the other exporting countries are Indonesia, Brazil, Sierra Leone, Australia, Fiji, Nigeria, and Jamaica. Indonesia, Taiwan, China, and Thailand are major exporters of fresh ginger to the world market. Others are Brazil, Costa Rica, Malaysia, Fiji, India, Nicaragua, and certain Caribbean islands such as St. Lucia and St. Vincent. Important suppliers of preserved ginger are Hong Kong, which reexports the refined fresh ginger, and Australia (ITC, 1995).

In order to analyze the issues related to the export and import trades, the study has distinguished two groups of countries:

1. Producer-exporters (countries engaged in cultivation of ginger and usually exporting the surplus over domestic consumption; occasionally, however, they may import ginger as well from some other countries).
2. Re-exporters

The relative contribution of the above two groups is given in Table 12.9.

Table 12.9 Percentage share of different groups in total world export of ginger

Year	Producer-exporters		Reexporters	
	Qty	Value	Qty	Value
1965	78.50	61.06		
1970	98.53	95.37	21.50	38.94
1975	96.62	94.61	1.47	4.63
1980	74.49	73.86	3.38	5.39
1985	69.60	70.58	25.51	26.14
1990	66.32	69.76	30.40	29.42
1995	84.28	77.07	33.68	30.24
Average	81.19	77.47	15.72	22.93
			18.81	22.53

Source: FAO (2003).

World Trade

Distribution Channels

Specialized importers still play an important role in the ginger trade. A list of importers can be obtained from the International Trade Centre (ITC).

Dry Ginger

The traditional distribution system for dry ginger has declined as a result of an increase of purchasing by dealers and processors direct from the source. There also has been an increase in trade in some countries among certain ethnic communities, Asian in particular, who have developed their own system of distribution based on direct trading with the producing countries and a network of small retail outlets.

Fresh and Preserved Ginger

The marketing structure for fresh and preserved ginger is that characteristic of fresh vegetables. The rise of supermarket chains has eroded the position of wholesalers since some importers sell direct to supermarkets. In some importing countries, however, ginger in its fresh form is seen almost exclusively in shops catering to ethnic communities.

Export

During 1994, China contributed 52.05% of total ginger export, followed by Thailand (16.77%), Indonesia (9.73%), Brazil (6.24%), Taiwan (3%), Costa Rica (2.23%), India (1.98%), Nigeria (1.61%), Vietnam (1.37%), Malaysia (1.36%), and the United States (0.93%). China and Thailand maintained top positions until end of 2000; during 2000, China contributed 61.59%, followed by Thailand 23%, Brazil 4.41%, Taiwan 2%, Nigeria 1.75%, Indonesia 1.46%, and India 1.17% of the total exports of ginger (Figure 12.4).

Ginger exports from Jamaica and Sierra Leone are considered to be of high quality on account of their superior flavor and clean appearance. However, the price of Jamaican ginger is very high, which has led importers to search for cheaper alternatives. Today, the ginger from Australia is regarded as being high-quality due to its standardized and clean appearance and its steady price. Grinders have favored the ginger from China, but

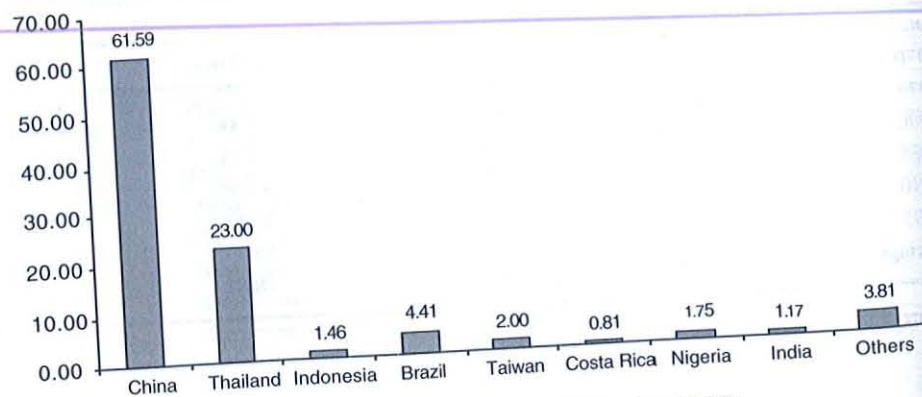


Figure 12.4 Country-wise contribution (%) to world ginger market (2000).

the use of the bleaching agent sulfur dioxide has adversely influenced Chinese exports to Europe and North American countries. In the Middle East, however, it is still widely used. Nigerian ginger is particularly used for oil extraction (ITC, 1995). As mentioned earlier, except in the case of Japan and the United States no separate statistics are available for the three different forms of ginger traded.

In order to see the trend in returns from trade earned by the exporting countries, Datta et al. (2003) has used a simple index (VADD) defined as:

$$\text{VADD} = \text{unit value of exports} - \text{unit value of imports}$$

Where

Unit value of exports = (total value of exports/total qty. exported)

Unit value of imports = (total value of imports/total quantity imported)

They have ranked all countries in terms of VADD in decreasing order and reported that:

- out of the top 15 countries, only three belong to the producer-exporter group. The rest all are from the reexporters group;
- Only two are the traditional producers.
- Of the major producers, India ranked 40th with a VADD of 0.38, followed by China at 44th place with a VADD of 0.21. In the case of Indonesia, the estimate for VADD turned out to be negative at (-)0.13, meaning that Indonesia imported ginger at a higher unit value than at which it exported.
- Thus, reexporters have, in general, succeeded in achieving a greater value addition to their export of ginger into the world market.

As it can be seen from Table 12.10, the unit price (US \$2.18/kg) earned by the European Union (EU) countries (reexporters) from export is much more than the average unit price (US \$1.53/kg) earned by other producer exporters to EU countries. The Netherlands, Germany, and the United Kingdom are the major reexporters of ginger in Europe.

Export Performance by India

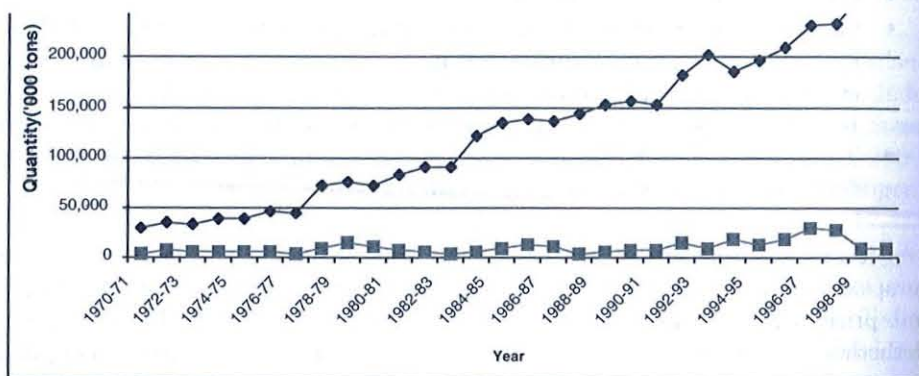
The world scenario viewed from the Indian perspective provides a complex situation for the ginger economy. India, being the largest producer of raw ginger in the world, has the potential to play a major role in the world trade for ginger. However, the potential is yet to be realized and the position has remained stagnant over the years in terms of the contribution to the total world export of ginger. Table 12.11 shows the export of ginger from India from 1970 to 2000. During 1970 to 1971, it was only 3156 tons, earning foreign exchange worth Rs. 26.094 millions. Then it further rose to 29,737 tons during 1996 to 1997 with a foreign exchange earning of Rs.592.441 millions. Figure 12.5. shows the increasing trend of both the production and export of ginger over the years. However, the quantity exported as the percentage of the total production has gone down to less than 5% in recent years.

Datta et al. (2003) has analyzed the export performance of the Indian ginger economy between 1961 and 1996 and has the following features.

Table 12.10 European Union: countrywise imports of ginger from country of origin (Qty: Tons, Value: US \$'000)

Countries	1992		1993		1994		1995		1996		Unit price
	Q	V	Q	V	Q	V	Q	V	Q	V	
Intra-Eu	672	1254	566	1146	860	1746	1129	2472	1568	3419	2.18
Extra-EU	12406	16022	11762	14925	12464	16151	13507	19013	15367	23533	1.53
Of which from:											
Brazil	2573	3385	3859	5348	3333	4426	2913	4532	2848	4279	1.50
Costa Rica	788	908	871	958	935	996	1300	1956	2860	4113	1.44
China	1366	2481	1321	2151	2514	3202	3263	3863	2573	3690	1.43
Thailand	2331	2864	837	1059	1070	1812	1778	2570	2173	3406	1.57
South Africa	571	864	379	820	303	625	742	1276	861	1480	1.72
Nigeria	2256	1596	1758	915	1524	931	991	868	1075	1253	1.17
Indonesia	398	521	771	818	707	1001	356	417	476	733	1.54

Source: ITC. (1995)

**Figure 12.5** Trend in production and export of ginger from India.

- The physical volume of exports has increased by approximately 2.96% annually, whereas the annual growth in value terms works out to be approximately 10%. The annual growth in the unit price realization over this period works out to be around 6.9%.
- At a decadal disaggregated level, however, the performance of exports of ginger from India does not look encouraging. There is a steady decline in unit value realization from ginger exports. During the 1960s, the unit value realization grew at an annual rate of more than 19%, despite the fact that there was a negative growth in the physical volume of exports. The growth in the physical volume of exports picked up considerably during the 1970s, although at the

Table 12.11 Export of ginger from India (1970–2000)

Year	Qty (tons)	Growth index	Value (Rs. in lakhs)		Except as % to total production
			Value	Growth index	
1970–71	3156	46.13	260.94		
1971–72	6746	98.61	275.31	70.91	10.67
1972–73	6050	88.44	209.94	74.82	19.44
1973–74	5083	74.30	255.93	57.05	17.99
1974–75	4681	68.43	351.27	69.55	13.22
1975–76	4786	69.96	410.49	95.46	12.35
1976–77	4461	65.21	584.32	111.56	10.6
1977–78	9762	142.70	1368.99	158.80	10.28
1978–79	14515	212.18	1431.72	372.04	13.62
1979–80	11486	167.90	726.96	389.09	19.17
1980–81	6841	100.00	367.97	197.56	16.15
1981–82	5603	81.90	395.23	100.00	8.3
1982–83	4253	62.17	588.49	107.41	6.25
1983–84	6232	91.10	1190.16	159.93	4.68
1984–85	8857	129.47	1872.76	323.44	5.14
1985–86	13331	194.87	1089.35	508.94	6.62
1986–87	10361	151.45	571.16	296.04	9.66
1987–88	3926	57.39	488.99	155.22	7.62
1988–89	6368	93.09	940.82	132.89	2.75
1989–90	8135	118.92	1262.44	255.68	4.15
1990–91	6555	95.82	1175.79	343.08	5.21
1991–92	14259	208.43	2188.1	319.53	4.27
1992–93	9825	143.62	1687.37	594.64	7.81
1993–94	18442	269.58	2478.12	458.56	4.87
1994–95	12022	175.73	1673.03	673.46	9.9
1995–96	18483	270.18	3892.13	454.66	6.08
1996–97	29737	434.69	5924.41	1057.73	8.81
1997–98	28268	413.21	7262.73	1610.03	12.79
1998–99	8683	126.93	4058.32	1973.73	12.1
1999–2000	8773	128.24	3060.15	1102.89	3.3

cost of a decline in the growth in unit value realization. The 1980s witnessed a fall in the growth rate of both of these attributes. During the first half of the 1990s, however, we again observed a spurt in the growth of physical exports, accompanied by an almost stagnant unit value realization, in spite of considerable devaluation of the Indian rupee over this period (Table 12.12).

Export Instability: In order to estimate the observed instability in ginger exports in terms of quantity, value, and price, an instability analysis was done using the time series data, and the results are presented in Table 12.13. It can be observed from the table that there was instability in the case of volume, value and unit value of ginger exports and the instability was relatively higher in the case of volume (72.91%) compared to

Table 12.12 Average annual growth rates in Indian export performance in ginger (1960–1996)

Year	Quantity	Value	Unit value
1960–96	2.94	9.99	6.85
1960–70	-14.72	1.65	19.19
1970–80	12.40	21.97	8.51
1980–90	1.05	8.52	7.40
1990–96	16.09	16.96	0.75

Table 12.13 Instability indices (Coppock's instability index) of ginger exports (1970–2000)

SI No.	Particulars	1970–71 to	1980–81 to	1990–91 to	1970–71 to
		1979–80	1989–90	1999–2000	1999–2000
1	Volume of ginger export	47.95	60.37	84.71	72.91
2	Value of ginger export	51.60	62.35	63.50	57.41
3	Unit value of ginger export	49.44	68.81	34.62	29.15

value (57.41%) and unit price (29.15%). The above instability index was a close approximation of the average year-to-year percentage variation adjusted for trend.

Composition of Indian Exports: As far as the itemwise export of ginger from India is concerned, there has been a marked improvement in recent years. More than half of the total export value is earned by dry ginger, which accounts for 30.16 percent in terms of quantity (Table 12.14). Fresh ginger, though, accounts for 66.65% of the total quantity exported; in terms of value, the percentage share is only 24.67. Ginger oil and oleoresin are the other products exported that have returned a high value. As in the case of reexporting countries, especially the EU countries, India has the potential to strengthen the processing industry to add more value-added products into its export basket.

India exports a sizeable quantity of fresh ginger through the land custom stations in the northeastern states to Bangladesh. Although this export channel provides an opportunity to market the exportable surplus across the border at a reasonable price, whenever

Table 12.14 Contents of Indian Export basket (1990–91 to 1999–2000 Average)

Item	Quantity (Mt)	% share in total			
		Value (Rs. lakhs)	Unit price (Rs./kg)	Qty	Value
Ginger, dry	4,587.80	2,182.58	48.92	30.16	51.76
Ginger, fresh	10,138.07	1,040.18	9.46	66.65	24.67
Ginger powder	418.32	209.46	48.08	2.75	4.97
Ginger oil	7.63	182.46	2,171.10	0.05	4.33
Ginger oleoresin	59.63	601.73	932.75	0.39	14.27
Total	15,211.45	4,216.41	30.12	100.00	100.00

Source: Spices Board, Cochin.

the price goes up, Bangladesh turns to a cheap supply from China and Indonesia. The same is the case with the other neighboring country, Pakistan (John, 2003).

Direction of Indian Exports: Until the end of 1980s, more than 30 percent of the Indian export of ginger was to Arabian countries, then from the 1990s onward, the share of Arabian countries in Indian exports, in general, has shown a decreasing trend, and India is finding a market in its neighboring countries of Pakistan and Bangladesh. However, these countries turn to other cheaper sources whenever the price goes up for Indian ginger. During 1991 to 1992, India exported more than 49% of its total ginger export to Pakistan. However, during 1999 to 2000, Pakistan's share in Indian exports of ginger declined to 33%, and during the same period, Bangladesh took an equal share with Pakistan (33%). During 1991 to 1992, Bangladesh imported hardly 7%, and its share increased to 33% by the end of the century. A sizeable quantity of ginger exported to Bangladesh is done so through major land custom stations in Mizoram (Table 12.15). Other main markets for Indian ginger are Saudi Arabia, the United Arab Emirates, Morocco, the United States, Yemen Republic, the United Kingdom, and the Netherlands. Figure 12.6A–C presents the direction of Indian ginger export in 1981 to 1982, 1991 to 1992, and 1999 to 2000, respectively.

To analyze the concentration of ginger exports to various countries both in terms of quantity and value of export markets, the Hirschman index was estimated and is presented in Table 12.16. Generally, the index number above 40% is considered to be high concentration. Here the estimated index for quantity is more than 40 during all the three periods indicating the higher concentration. In the case of value also, the index was more than 40% in the first period, and it was nearer to the 40% mark in the remaining two periods. This indicates that the country has a set of markets, which prefers Indian ginger.

Export Promotion Programs: For export promotion of ginger, the Spices Board (Government of India) is implementing a number of programs (Spices Board, 2000). Some of them are:

- Assistance for establishing improved cleaning and processing facilities
- Support for setting up of high-technological processing

Table 12.15 Ginger export through land custom stations to Bangladesh

SI No.	Land custom station	Year	Quantity (Mt)	Value (Rs.)	Unit value
					(Rs./kg)
1.	Karimganj	2001–02	1443.30	14128456	9.79
2.	Agartala	2001–02	258.60	2315528	8.95
Total			1701.90	15443984	9.37 (average)
1.	Karimganj	2002–03	3118.90	23558883	7.55
2.	Agartala	2002–03	505.00	4667019	9.24
Total			3623.90	28225900	8.40 (average)

Source: John (2003).

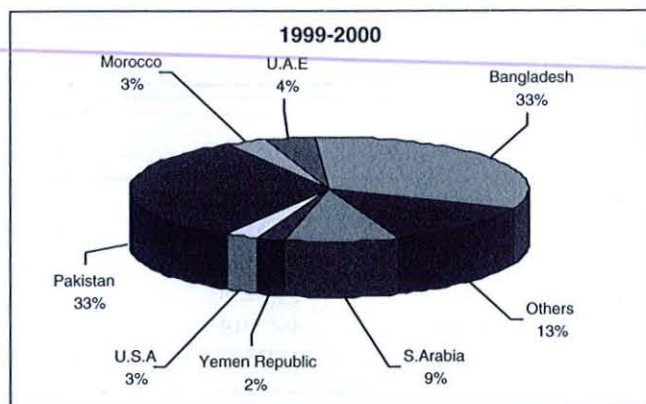
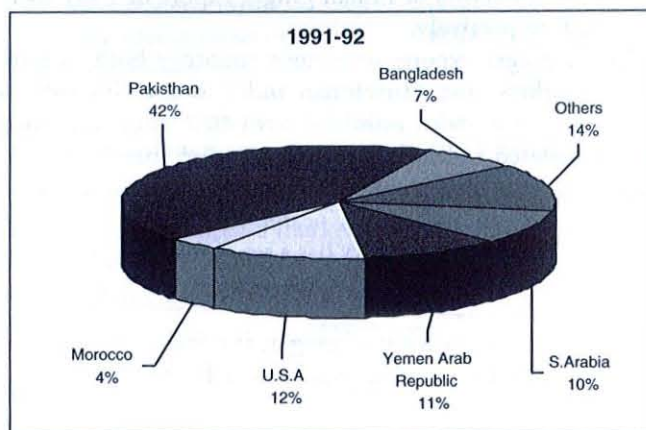
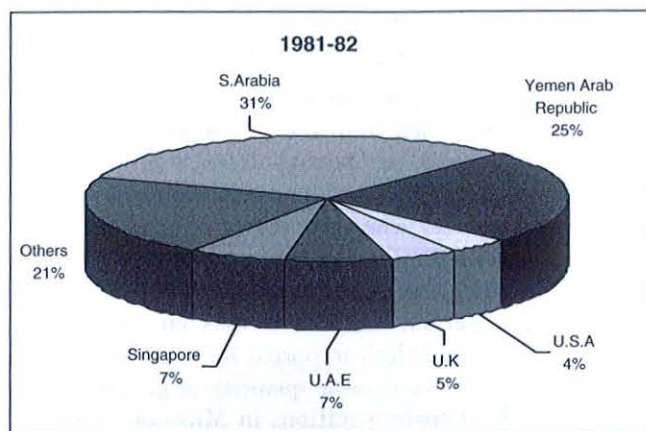


Figure 12.6 Direction of Indian exports of ginger

Table 12.16 Hirschman index—export

Period	Particulars	Quantity	Value
1981-82	Volume of ginger export	44.35	45.47
1991-92	Value of ginger export	48.52	38.63
1999-2000	Unit value of ginger export	48.42	36.87

- Assistance for establishing and strengthening in-house quality laboratories for testing various quality parameters
- Assistance for new product/end-use development
- Assistance for improved packaging
- Assistance for undertaking sale promotional tours and participation in international fairs
- Support for promoting branded consumer-packed ginger in identified markets abroad
- Support for organic certification for processing of ginger derivatives

Imports

In fact in the international market major importers of ginger are the United States, Japan, and the United Kingdom, where an increase in imports in terms of volume and value has been recorded over the years. These countries are importing mainly from China and Thailand (ITC, 1995).

Japan accounted for the major share (58.74%) of imported ginger during 1995, followed by the United States (9.93%), Hong Kong (7.62%), Singapore (5.16%), Saudi Arabia (4.37%), the United Kingdom (4.36%), Canada (2.39%), the Netherlands (1.93%), Germany (1.25), Malaysia (0.78%), and the rest by others including India (Table 12.17). The trend in import of ginger among the countries has remained the same with little change until 2000. During 2000, Japan accounted for a 57.68% share

Table 12.17 Ginger imports by major importing countries (1995 and 2000) (Q: tons, V: US \$'000)

Country	1995			2000		
	Qty	%	Value	Qty	%	Value
Japan	83,274	58.74	76,985	104,342	57.68	76,938
United States	14,081	9.93	16,430	18,380	10.16	18,792
Saudi Arabia	6,189	4.37	4,449	8,106	4.48	4,566
United Kingdom	6,174	4.36	8,135	9,614	5.31	12,480
Malaysia	1,108	0.78	756	7,627	4.22	3,648
Canada	3,388	2.39	4,183	4,572	2.53	4,876
Netherlands	2,742	1.93	3,602	6,662	3.68	7,089
Singapore	7,314	5.16	4,850	7,564	4.18	4,237
Germany	1,769	1.25	3,075	2,172	1.20	3,696
Hong Kong	10,806	7.62	5,896	908	0.50	673
Others	4,915	3.47	5,492	1,0957	6.06	7,396
TOTAL	141,760	100	133,853	180,904	100.00	14,4391

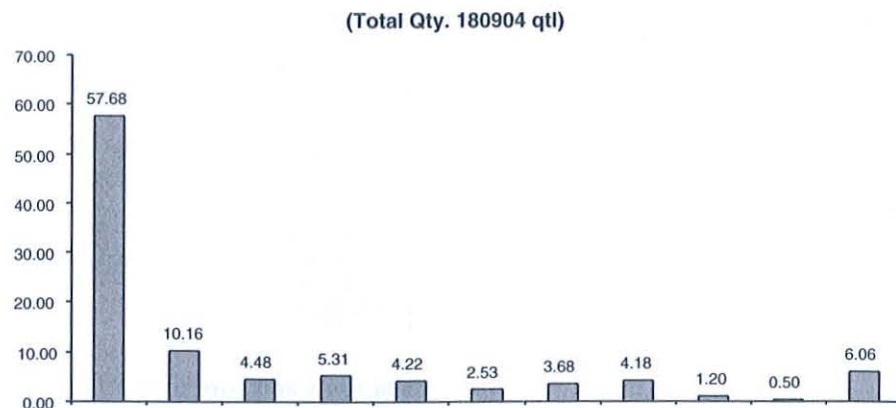


Figure 12.7 Share of importing countries in international ginger market (2000). Order of countries as in Table 12.17.

followed by the United States (10.16%), the United Kingdom (5.31%), Saudi Arabia (4.48%), Malaysia (4.22%), Singapore (4.18%), the Netherlands (3.68%), Canada (2.53%), Germany (1.20%), and Hong Kong (0.50%). In Figure 12.7, ginger imports by various countries are depicted in graphical form for the year 2000 indicating more or less the same situation after 5 years.

Japan, one of the major importers of ginger in the world, imports more than half of its requirement from China (Table 12.18). Thailand exports most preferred fresh ginger in large quantities to Japan. Japan's imports from India mainly constitute dry ginger. In recent years, the Spices Board has taken initiatives to study the Japanese market to increase India's share in that country's imports.

U.S. Imports of Ginger

In the United States, fresh ginger dominates the import market while dried ginger accounts for only a fraction of the government's unground total import. Ginger import increased over 50 percent in import tonnage in 1999 and gained another 14 percent in the year 2000. Since dried ginger is most heavily used in processed foods, its increasing

Table 12.18 Ginger imports by Japan (1994–1998) average, qty. = tons, value = US \$'000

Country	Qty	Value	Unit value	Qty	Value
China	45,089.6	49,643.8	1.1068	56.5	55.9
Thailand	27,549.6	24,802.6	0.90244	34.5	27.9
Taiwan	3,753.6	11,308	3.06371	4.7	12.7
India	213.8	400.6	1.94193	0.3	0.5
Vietnam	1,114.4	827.4	0.71068	1.4	0.9
Indonesia	1,914.2	1,577.8	0.72868	2.4	1.8
Australia	79.8	120.6	1.51128	0.1	0.1
TOTAL	79,790.4	8,8851	1.10773	100.0	100.0

imports are undoubtedly a reflection of the growing numbers of Asian-inspired products being brought to the supermarket shelves today. Asian cooks have taught the rest of the world that ginger is not only for baking and beverages, it is also excellent with meats, poultry, fish, and vegetables. Mainland China, India, and Nigeria, in that order, are the main sources of dried ginger. Jamaican ginger also has its main market in the United States.

Although the available statistics (USDA/FAS, 1998, 1999) do not differentiate between fresh and dried ginger clearly, the figures in Table 12.19 give an indication about the quantity of imports and their origin. Value-added ginger products such as candied ginger

Table 12.19 Imports of ginger (itemwise) by the United States during 1998 (Qty in kg and value in US \$)

Countries	Ginger, unground		Ginger, ground		Ginger, sweet		Ginger, candied	
	Qty	Value	Qty	Value	Qty	Value	Qty	Value
Australia	0	0	0	0	5675	21804	352315	1507713
Brazil	3520415	3424284	0	0	0	0	0	0
Canada	871	2400	0	0	75866	70594	0	0
China	2361380	2545324	35078	45827	96457	187628	56367	127079
Costa Rica	3091078	2044889	33771	52416	16680	16800	0	0
Dominican Republic	4121	3400	0	0	0	0	0	0
Ecuador	104746	65879	0	0	0	0	0	0
Germany	0	0	50	3294	0	0	0	0
Greece	0	0	0	00	0	0	0	0
Guatemala	388311	177426	0	0	0	0	0	0
Honduras	349023	229187	0	0	0	0	0	0
Hong Kong	27575	34932	1531	4555	55444	152630	4563	8302
India	1150519	1639468	165732	379930	13678	19547	0	0
Indonesia	26833	41360	0	0	0	0	37061	117140
Italy	2896	21000	0	0	0	0	0	0
Jamaica	6037	32047	0	0	0	0	0	0
Japan	14554	30463	10000	26563	20	2434	0	0
Korea Republic of	0	0	0	0	0	0	0	0
Leeward-Windward Islands	0	0	0	0	0	0	0	0
Malaysia	2813	10232	0	0	0	0	0	0
Nicaragua	119394	67278	0	0	0	0	0	0
Nigeria	664610	799444	0	0	0	0	0	0
Other Pacific Islands: NEC	393408	513229	0	0	0	0	0	0
Singapore	0	0	0	0	2139	6530	7749	21130
South Africa	2840	11806	0	0	0	0	0	0
Taiwan	11874	26940	0	0	12791	60863	0	0
Thailand	1514935	1529921	3439	12184	483971	533908	222077	465148
United Kingdom	0	0	0	0	22570	72923	0	0
Vietnam	0	0	0	0	0	0	2828	3570
Western Samoa	0	0	0	0	0	0	0	0
Other	22500	79429	5658	21669	38400	91632	2932	9706
TOTAL	13777837	13309338	258155	567438	823691	1237293	685892	2259788

is only imported from a few countries, such as Australia, China, and Thailand, whereas the unground ginger, which includes fresh ginger, is being imported from more than 20 countries

Indian Import of Ginger

A sizeable quantity of ginger is imported into India, mainly in the green form. The major imports in the fresh form are from Nepal, whereas dried ginger is imported from China and Nigeria. The quantity imported and their values are given in Table 12.20.

Market Opportunities

According to an ITC market development paper (1995), consumption of spices is likely to increase due to an augmented production of high-flavored food by the food industry. In addition, an increasing interest in health food and, consequently, "natural" instead of "artificially" flavored food, will also increase the consumption of spices.

Dry Ginger: There is a place for newcomers in the market. A development noted in the trade of ginger has been the increasing use of oils and oleoresins and powdered and processed ginger in major importing countries, especially in Europe and the United States. Ginger exports for the manufacture of powdered ginger must be fiber free, whereas the products exported for the manufacture of ginger oil and oleoresins should have a high oil content. Export efforts should be based on increased productivity and improved postharvest technology.

Fresh Ginger: There may be some prospects for a moderate increase in international trade in fresh ginger, mainly for the ethnic market, especially Asian communities.

Preserved Ginger: Japan will continue to be the largest market, but some growth is also expected in other countries in Western Europe as well as in the United States. In general, however, the prospects for preserved ginger remain modest.

Competitiveness of Indian Ginger Industry

In order to understand the position and competitiveness of individual exporters in the world trade of ginger, market shares and unit value ratios were calculated and are presented in Table 12.21. In the absence of time series data on prices for individual products from various countries, the unit-price was worked out from the value of the export and quantity exported. While calculating the unit price, individual items of

Table 12.21 Unit-price ratio for various exporting countries (1994–98)

Countries	1994	1995	1996	1997	1998	1994–1998
China	0.90	0.83	1.17	1.03	0.94	0.96
Thailand	0.87	1.06	0.91	0.82	0.73	0.86
Indonesia	0.54	0.51	0.43	0.62	0.48	0.53
Brazil	1.61	1.64	1.11	1.26	1.36	1.35
Taiwan	3.18	3.83	2.00	2.43	3.21	2.76
Costa Rica	1.19	1.33	0.89	1.01	1.10	1.10
India	1.23	2.07	1.06	1.20	1.80	1.40
Nigeria	0.74	0.97	0.85	1.16	1.36	1.06
Vietnam	0.50	0.67	0.57	0.89	0.56	0.66
Malaysia	0.35	0.43	0.32	0.37	0.38	0.36
United States	1.99	1.96	0.86	1.04	1.45	1.29
Others	1.77	1.53	0.96	1.12	1.65	1.33

export were not taken into account. So there is bound to be a slight variation depending upon the share of value-added products in the export basket of individual countries. However, the estimated unit value ratios help in comparing the prices of each exporting country with another and with the average of total imports. The ratio is computed by dividing the price received for a country's export by the world average price. When the unit-price ratio is less than 1, then it is considered that the country possesses competitiveness in the export market for its product. Accordingly, as it can be observed from Table 12.21, countries such as Indonesia, China, Thailand, Vietnam, and Malaysia with their unit-price ratio less than 1 are highly competitive, whereas India with an average unit-price ratio of 1.40 is considered to be less competitive in the world market.

Any country's competitive power in exporting a commodity depends crucially on its relative price and the quality of that commodity over the competing countries. India has a weak competitive position in the international market for ginger, which is mainly because of very low productivity of 3,357 kg/ha against 55,636 kg/ha in the United States and an average world productivity of 10,179 kg/ha (FAO, Rome). Moreover, the increased cost of production due to less productivity of Indian ginger compared to that of other producing countries makes it imperative for India to increase productivity, which alone can reduce the cost of production. The country has enough potential to increase its productivity, as it is shown in Figure 12.8. To be successful in the changing environment, it would be essential to be innovative and proactive. India, being the major producer of ginger in the world, stands seventh when we look toward the performance of other exporting countries.

The gross margin is a good measure for comparing the economic and productive efficiency of similar sized farms. More importantly, it represents the bare minimum that a farm must generate in order to stay in business. The cost-benefit ratio worked out for ginger production in the United States was 1.34. Productivity achieved on the ginger farms of Hawaii ranged from 50,000 lbs/acre to a low of 27,500. The reported average returns for the farm with a productivity of 46,200 pounds depends not only on the yield but also the price.

Table 12.20 Item-wise imports of ginger into India during 1995–2000 (Qty: Metric tons, Value: Rs. lakhs)

Item	1995–1996		1996–1997		1997–1998		1998–1999		1999–2000	
	Q	V	Q	V	Q	V	Q	V	Q	V
Ginger, dry	782.62	218.55	133.98	64.67	247.39	106.19	542.30	291.42	4695.01	1198.47
Ginger, fresh	6682.21	429.03	9277.76	580.71	11185.43	703.10	9727.21	614.76	7164.17	688.72
Ginger powder	—	—	—	—	—	—	neg	0.03	13.00	6.44

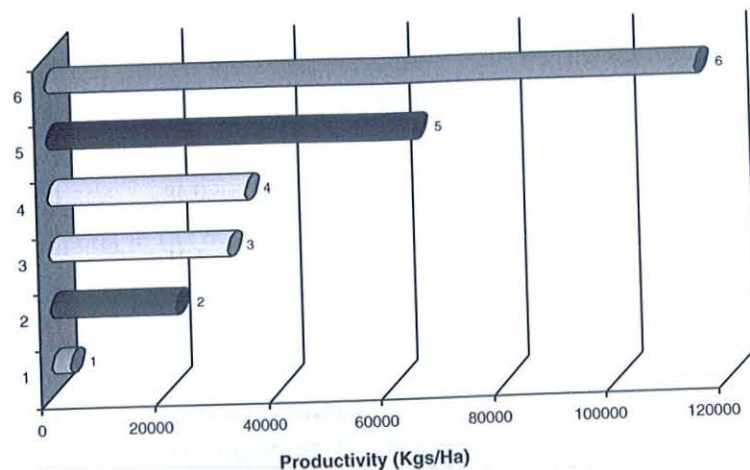


Figure 12.8 Productivity gap for ginger in India. 1. National average (3,391 kg/ha). 2. Productivity level of elite farmers (20,000 kg/ha). 3. Productivity reported from research farm (22,200 kg/ha). 4. State level highest productivity (35,000 kg/ha). 5. Highest productivity reported in farmer's field (65,000 kg/ha)—Shimoga, Karnataka. 6. Highest productivity achieved in the world (115,104 kg/ha)—China.

Risk and Uncertainty

Risk is inherent in all of agriculture, but the ginger industry appears to be more exposed to risk than many other agricultural endeavors (Fleming and Sato, 1998). A review by the Hawaii Agricultural Statistics Services (HASS) reveals considerable volatility in ginger price and yield, with relatively little correlation between the two variables. In addition to abruptly fluctuating prices, ginger is relatively susceptible to serious disease problems, providing an ever-present possibility for a disease problem sharply to reduce yields (Nishina et al. 1992). A sustainable ginger economy is possible only when these risks are minimized.

Along with price risk, cash flow implications are the perceived crop risk for a crop such as ginger. This is related to age to first bearing and longevity of the crop. Production and marketing risks are greater the longer the crop takes to bear and the greater the life of the crop. The length of the harvest period also has its risks; the longer the period, the greater the risk of failure. Vinning (1990), in an Australian Centre for International Agricultural Research (AICIAR) technical report for marketing perspectives on a "Potential Pacific Spice Industry," has given crop risk ratings for various spice crops based on the above points. It was found that ginger topped the list as a high-risk commodity, followed by vanilla.

The ginger industry is facing risk and uncertainty in different forms. Each country has to face considerable competition from other ginger-producing countries because many new countries have entered into the industry in recent years. Over the years, India has lost her market to China and Indonesia, mainly because of the price factor. From the Indian farmers' point of view, the prices have been generally good during the past 10 years, although there was a drastic fall in the 1996 to 1997 and 2001 to 2002 crop years. During 1999 to 2000, ginger farmers received an all-time high price, which was more than double the price in the previous crop year. The price was always above the breakeven point, with an average of Rs.8.80/kg for fresh ginger in the northeastern

states, where fresh ginger is marketed, thus leading to profitable ginger farming. The price for dry ginger was well below the breakeven point in the 1980s and in the early 1990s as well. During 1982 to 1984 and 1993 to 1995, the price almost doubled. In addition to this abrupt fluctuation in price, the ginger crop is also highly susceptible to serious disease problems leading to a reduction in yield and an unmarketable production. At times, the farmer may lose up to 80% of the crop toward the end of the crop cycle. Thus, the ginger crop industry is influenced by the risk factors of yield and price, although they are not related as per the analysis of long-term data. However, the analysis of variance indicates that the price variability of ginger is greater than the yield variability.

Prospects and Policy Measures

1. India, being the major producer of ginger, accounts for 33% of the total share in production but contributes hardly 1.17% to the world market with enough surplus to export.
2. There is a definite pattern of cyclical fluctuation in production, mainly due to the producers' response to price. Price stabilization measures can boost production further.
3. During the 1980s, Saudi Arabia was the major market for Indian ginger with an export of 31% of its total export. In the changed scenario of the 1990s and 2000, Pakistan and Bangladesh were the major markets.

While considering policy measures to strengthen the ginger economy of the country, it is imperative to undertake action plans at disaggregated levels—the regional level to begin with, followed by the handling of national issues. Following are the suggested policy measures to overcome the constraints faced by the ginger farming industry in India:

1. Healthy seed production through the "seed village concept" by regular field monitoring and development of seed certification procedures
2. Impose quarantine regulations to restrict seed transportation from one state to the other, especially where bacterial wilt is a major problem
3. An integrated approach to control a serious problem in ginger cultivation, rhizome rot; which is complicated by insect, bacterial, and fungal attack, is the need of the hour.
4. The higher fiber content in Indian ginger compared to that of its competing countries and the higher cost of production in India seem to act as deterrents in increasing our export trade. Hence, there is an urgent need to evolve high-yielding, disease-resistant cultivars with lower fiber but richer volatile oil and oleoresin contents.

The above measures can ensure disease-free seed material to the farming community and will reduce the crop risk due to disease and heavy postharvest losses at the farm level.

Varieties with the above quality parameters are already available from research organizations in India, and there is a need for adequate extension activities to allow the technology to reach farmers' fields.

5. Another aspect where a major thrust has been wanting is to develop cropping systems with ginger as a component, although it could be grown as an intercrop in coconut and arecanut plantations, we are yet to develop ideal systems with attention to a cost:benefit factor, soil disturbance, the shade and root effect, and other factors.

An issue related to the above point is that treating ginger as an agricultural commodity while in its raw form and as a spice when dried is creating certain logistical problems in realizing the fullest potential of ginger in the world market. An effort should be made to solve this definitional ambiguity and due consideration should be given as in other spice commodities.

6. With sweeping changes occurring in the standard of life, life style, and consumption patterns in the buying countries, and with the focus being shifted toward value addition and branded consumer packs, the market development activities need to be geared up.
7. Since importing countries show a definite preference to an uncontaminated and clean product, there is a need for collective efforts on the part of the farmers, traders, and exporters to upgrade the quality of ginger through improved preharvesting practices, postharvest handling, processing and packaging, and storage to keep up with the grade specifications, pesticide residues, aflatoxin level, and microbial load.
8. Indian farmers need to be educated and trained to stand up effectively to the challenges. The need to adopt measures to be more competitive in terms of both quality and productivity assumes greater significance in view of the opening up of the agricultural sector and lowering of agricultural tariffs in accordance with World Trade Organization (WTO).
9. Since a high-value product line is emerging through organic farming, efforts should be made to popularize organic farming in ginger, so that it fetches a high demand in foreign markets.
10. One should not get the feeling that by value addition we just mean production of ginger derivatives alone. One EU document reveals that in the export market, "buyers are looking for clean, well flavored, artificially dried product with high-hygiene levels, in contrast to the bulk of the materials which has been sun dried on the ground" (Commonwealth Secretariat, 1996, p. 45).

For the successful implementation of above the policy related-suggestions, there is a need to develop a special database regarding all aspects of ginger-based activities such as marketing, employment potential, production techniques, cost of cultivation, and value addition. This, in turn, will help in creating decision support systems to benefit the stakeholders.

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