Review of Global Tea Production and the Impact on Industry of the Asian Economic Situation

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Abstract

Tea is a beverage made by steeping leaves in boiling water. The common tea plant is the evergreen shrub Camellia sinensis. *There are several varieties of this species of plant, a well known one being the Indian Assam tea (*C. sinensis *var.* assamica *Kitamura). Although there is a growing number of countries producing teas, in a multiplicity of blends, there are in fact only three main types of* Camellia *tea, green, 'oolong', and black. The difference lies in the 'fermentation'. A brewed cup of tea contains a moderate amount of caffeine, volatile oils, tannin and several B-complex vitamins. The flavor of tea is produced by these volatile oils, while astringency and color come from tannin.*

Tea is the most popular and cheapest beverage, next to water, in the world. It is consumed by a range of age groups in all levels of society. Some three billion cups of tea are consumed daily worldwide. However, 50-60% of the production cost is in the labor cost. The tea industry makes a vital contribution to the economy of the producing countries. The countries that produce tea are largely developing countries with large pools of low-cost labor. Tea is considered to be a part of the huge beverage market, not in isolation.

Keywords: *Camellia sinensis, low-grown tea, mid-grown tea, high-grown tea, green tea, 'oolong' tea, black tea, white tea, yellow tea, compressed tea, reprocessed tea, herbal tea, pekoe, fermentation.*

Introduction

The Asian region produces a varied range of teas and this, together with a reputation in the international markets for high quality, has resulted in her enjoying a share of every import-ing market in the world. Africa and South America also produce tea. Huge populations of Asia, the British Isles, Middle Eastern countries, Africa, and all the countries of the former Soviet Union, take tea throughout the day.

Tea is a beverage made by steeping leaves in boiling water. The common tea plant is the evergreen shrub *Camellia sinensis*. There are several varieties of this species of plant, a well-known one being the Indian Assam tea *(C. sinensis* var. *assamica* Kitamura). Traditionally, tea is prepared from its dried young leaves and leaf buds. Although China is credited with introducing tea to the world, the evergreen tea plant is native to Southern China, North India, Myanmar and Cambodia.

Low-grown teas are produced from 0 to 600 m., mid-grown from 600 to 1,200 m, while the high-grown teas are cultivated between 1,200-2,000 m. The mid-grown and the high-grown in some areas can be divided into 'western' and 'eastern' according to the location of the estates.

High-grown teas have a bright liquor and superb flavor. This superior quality is caused by the cooler temperatures at these altitudes which induce slower growth than in the hot, moist, low country. The seasonal monsoons, of course, also greatly affect the quality of tea (Anon. 1996).

Although there is a growing number of countries producing teas, in a multiplicity of blends, there are in fact only three main types of *Camellia* tea, green, 'oolong', and black. The difference lies in the 'fermentation', which actually refers to oxidative and enzymatic changes within the tea leaves, during processing. Green tea is essentially unfermented, oolong tea is partially fermented and black tea is fully fermented. Black tea, which represents 90% of international trade, yields an amber colored, full-flavor liquid without bitterness (Antol 1996; Marchant 1996).

In addition to these conventional teas, many countries of Asia have a number of herbal teas, made from brewing plant leaves, or other plant parts including flowers. For example, *Gymnema sylvestre* a member of the botanical family *Asclepiadaceae*, found mainly in India, has been used as a healthy and nutritive herbal tea which claims to have a number of medicinal properties (Chomchalow 1996). Numerous other herbal teas are gaining more and more popularity recently.

Both orange pekoe and pekoe are black teas. The term 'pek-ho' is Chinese for 'white hair' or 'down', and refers to the golden-tipped Assam teas. Orange pekoe is made from the very young top leaves and traditionally comes from India or Sri Lanka. Pekoe comes from India, Indonesia or Sri Lanka and is made from leaves even smaller than those characteristically used for orange pekoe (Antol 1996).

Composition, Production and Processing of Tea

Composition

A brewed cup of tea contains a moderate amount of caffeine, volatile oils, tannin and several B-complex vitamins. The flavor of tea is produced by these volatile oils, while astringency and color come from tannin.

A cup of tea contains only 4 calories, a low-energy beverage. With sugar and milk this rises to 40 calories. Six cups of tea with sugar and milk will add 240 calories to the diet (but also 10% of the recommended daily allowance (RDA) for B-complex vitamins). Black tea yields an amber-colored, full-flavored liquid without bitterness. Fully 90% of the international trade consists of black tea, as illustrated by the innumerable varieties and blends of black tea.

The Egyptians prefer strong teas with dark liquoring. These teas are fired longer and come from the lower elevations. Tea drinkers of the Persian Gulf enjoy an even stronger and more darkly liquored tea. They also relish the velvety flavor of the luxurious and expensive silver tip and golden tip teas. The British like the milder, light liquored teas which come from higher elevations. Sri Lankans choose the dark liquored broken orange pekoe, while Arab customers are fonder of the pungent, sweetish dust grades.

Tea bags are very popular with Australians, closely followed by Saudi Arabia and Egypt. One favorite tea that is popular in the US and in the UK, where the blend originated, is 'Earl Grey Tea', a blend of three black teas. The perfume and distinctive taste comes from the bergamot *(Citrus bergamia)* - a small citrus fruit whose rind yields the essence.

Production and Processing

In the Fields: Plucking is done on a ten-day basis from 0-1200m and every three weeks from 1200 to over 2000m. Tea is either fine plucked, only the flush (two leaves and the bud) or coarse plucked (a sprig with more than two leaves).

Weighing: Weighing is done after every tea plucker has picked between 20-30 kg of leaves in three shifts, depositing them in wicker baskets or gunny sacks which are then transported to the factory.

In the Factory: The various stages of black tea manufacture are:

- Withering

- Rolling
- Roll-breaking (or green leaf sifting)
- Fermentation
- Drying (firing)
- Sorting (grading)
- Packing and marking for sale or shipment.

International Production of Tea

The main tea producing countries are:

Asia: Bangladesh, China, India, Indonesia, Sri Lanka, and Taiwan.

Africa: Burundi, Kenya, Malawi, Mauritius, Rwanda, South Africa, Tanzania, Uganda, Zaire, and Zimbabwe.

South America**:** Argentina, and Brazil.

In addition, Russia and a number of CIS countries also produce a large quantity of tea.

World Tea Production in 1996

World tea production further increased in 1996 from the previous record of 2.6 million t of 1995. For the first eight months of 1996, most producing countries reported significant rises in production compared with the corresponding period of the previous year: Bangladesh (by 24%), India (11 %), Kenya (7 %) and Sri Lanka (3%). These occurred largely due to good weather and greater use of agricultural inputs.

Developments in International Tea Trade

Demand by major importing countries recovered in 1996, after an 8% decline in 1995. Imports by the United Kingdom rose 13% in the first eight months of 1996, and increases were also registered in many other EC countries such as Germany where shipments almost doubled. Imports into the US, which were low in 1995 due to large carry over stocks, increased by 9% in the first six months of 1996. Similarly, demand in other major importing countries was strong, particularly in the Russian Federation where imports in 1995 reached 169,000 t and are expected to further increase. Information obtained from exporting countries suggests that imports by the Russian Federation increased by 10% in the first six months of 1996. The highest growth in exports to the Russian Federation was from Sri Lanka, which recorded a 45% increase over the 11,900 t exported during the same period in 1995.

Since quality preferences vary among importing countries, not all tea exporting countries gained from the increased import demand. For instance, exports from India, Indonesia and Kenya increased significantly while other countries including China, Malawi and Sri Lanka suffered slight declines.

Although world tea prices increased in 1996, they continue to be vulnerable to downward pressure since production is expected to expand as new areas under tea come into bearing in the next few years. However, the experience of 1996, when a steep growth in demand led to an increase in prices rather than a decline, may still be repeated if import demand from the Russian Federation continues to grow and a significant rise in domestic consumption takes place in India, China and other Asian countries.

Commercial Importance of Tea

The tea industry makes a vital contribution to the economy of the producing countries. The countries that produce tea are largely developing countries with large pools of low-cost labor.

The World Trade in tea exceeds 2.5 mill. t, which fetch around US$ 1.50/kg, indicating on trade figures alone a turnover of some US$ 3.75 billion. For example in Sri Lanka alone, around 273,000 ha are devoted to tea cultivation, which then provides direct or indirect employment to over one million people. Around 25% of the world import demand and the revenue from tea, represents almost 50% of the countries, foreign currency earnings (Anon. 1996).

Potential Impacts on the Industry of the Asian Economic Situation

The economic crisis has mostly affected the South East Asian countries (ASEAN), but this has had a ripple effect on all other economies including those of the developed countries.

The impact is expected to be felt mainly through reduced import demand by the countries affected. The severe squeeze on working capital is likely to reduce to some extent the ability of the countries affected to take advantage of their increased export competitiveness.

Many of the ASEAN countries are consumers of tea both green and black, and in some countries, particularly in rural areas it is a way of life. In countries such as Indonesia, Malaysia and Vietnam where tea is grown, the volume of local consumption has remained stable due to ready availability and also at lower prices. However, the other countries which are dependent on tea imports may find availability restricted in spite of the possibly lower export prices from the producing countries in these areas as naturally importers will curb the volumes of imports due to limited bank finances being available. One factor that could emerge in such a scenario is that there will be demand for the poorer quality products which would have an adverse effect in the long run for the tea industry.

This same effect could even be seen in other wealthier countries in this area such as Korea, Taiwan and Japan as already the sale of speciality teas meant for niche markets have shown a drop. This selective buying may have effects on the major producers of quality teas such as India, Bangladesh, Sri Lanka and Kenya, as already the good high grown and medium quality teas have shown a decline in prices in some markets.

The domestic markets in these producer countries and others could slow down, as tea is consumed also with sugar (as much as 3-4 spoons per cup). Even sugar imports may also be curbed in spite of lower prices, as these countries have also been affected by the slow down of the ASEAN and Far East economies. This position could be applicable to the CIS, East European, Near East and Middle East countries, although still there is no downward trend in the good/better types of teas evident as yet.

The Western European and North American markets could continue in a stable manner unless their economic positions are very much affected which is not evident in a marked way as yet. However, the summer seasons are now passing the Middle East, Europe and North America the tea consumption as a hot beverage will probably show a decline and hence the purchases from the producer countries could drop, affecting further the tea growing countries for example Indonesia, Vietnam, etc.

In this scenario of expected rather depressed markets more cheap, 'rubbishy' tea could try to find a market whilst producers of good quality teas may not find selling prices remunerative. This could be a good time to curb the production/exports of poor teas to the world markets to ensure that the genuine producers of the better product can still remain viable. It is also likely that small holder farmers may shift away from a non-remunerative agricultural crop to something else, which if it happens, would be detrimental for the industry in the producer countries.

Overall, the outlook could be somewhat bleak for the tea industry with the anticipated rather depressed markets and urgent attention must be focussed to remove poor teas and market the good teas and speciality teas if the industry is to successfully weather the economic crisis (Warakaullem, pers. comm.).

Quality Preferences

Quality preferences by importing countries impacted on trade flows and prices. For instance, Ceylon tea was preferred by Russia and CIS countries; CTC-style tea was favored largely by the U.K., Pakistan and Egypt; and in North America the low-priced and light-liquoring teas were in demand (FAO 1996).

Improvements to the Minimum Export Standards for Tea

In discussions on tea quality preferences, a system of establishing a minimum standard, where

the first judgment is made by the traditional tea taster and the tea is subjected to chemical analysis only if the taster is in doubt, would not be a practicable system for international trade. For instance, it could be envisaged that a tea taster approved the tea in the country of origin while in the importing country it might still fail to meet the ISO standard.

Therefore, a minimum standard for international trade in tea still needs to be based upon criteria which can be measured objectively and scientifically and as stated above the ISO 3720 standard already has a certain degree of acceptance. Essential tests for minimum exports standards include *water extract percentage, crude fiber percentage, and moisture content* (FAO 1995a).

Added-value through Process and Product Development

Tea is the most popular and cheapest beverage, next to water, in the world. It is consumed by a range of age groups in all levels of society. Some 3 billion cups of tea are consumed daily worldwide. Tea is considered to be a part of the huge beverage market, not in isolation. (Pettigrew 2001). However, 50-60% of the production cost is in the labor cost. Generally, the age of plantation workers is increasing as the younger generations do not wish to work in plantations. Mechanization is thus inevitable, along with imported labor. There is potential for agro/ecotourism to tea plantations and producers should become market-oriented and added-value conscious.

Types of Teas

There are numerous types of teas produced in many tea-producing countries. In China, for example, the country with the largest planting of tea and second in output, green tea is around 50% of the total export, black tea around 30%, and other teas 20%. Depending on the manufacturing technique it is known as green tea, black tea, oolong tea, white tea, yellow tea, and compressed tea. Most popular teas are described below:

Green Tea: There are many kinds of green tea, comprising 70.3% of the output in 1995. These include 'Meecha', a striped shape, 'Gunpowder' in round shape and 'Longing' in flat shape.

Oolong Tea: Originating in the 18th century and 9.4% of output in 1995, this tea's special aroma is characteristic. Various degrees of fermentation give tea called 'Pouchong', lightly fermented, or 'Tie-Qian Yin', heavily fermented. Their non-caloric and weight-suppressing nature make them popular with men and women alike.

White and Yellow Teas: These are characterized by the respective color of the hair on the bud and slender leaves under surface. These teas comprise only 0.1% of output.

Compressed Tea: This tea is mainly supplied to the minority areas of China and is manufactured by compressing crude tea. It comprises only 3% of the 1995 output, down from 15% in the 1980's.

Reprocessed Teas: These are those such as scented tea from Arabian jasmine (*Jasmimum sambac*), 'Zhulan' (*Choranthus spicatus*), 'Tai-tai' (*Citrus aurantium* var. *amara*) and rose (*Rosa rugosa*) with scent added, make the respective teas: jasmine tea, Zhulan tea, Tai-tai tea and rose black tea.

Famous Tea (Quality Tea): It has a beautiful, well twisted shape, 'joyful' color, flavorsome, and fresh taste. There are some 500 variations of this ancient form of tea, ranging up to 20% of output in same provinces in China (Zongmao 1996).

Product and Process Development of Tea

Traditional loose tea has been largely replaced by bagged tea in many forms, due to convenience. There are a range of preferences for tea styles and drinking habits among different consumers in various countries. This product and

process development has added-value to the tea products. Examples of such teas are:

Iced-tea	- USA
Fruit flavored tea	- Europe
'Foamy' tea	- Taiwan
Herbal tea	- USA, China, Japan, Thailand
Ready to drink tea (in cans)	- Japan, USA, Taiwan

Green and black tea will still be major forms of tea. However, instant tea, flavored tea, decaffeinated tea, organically-grown tea, 'foamy' tea, herbal tea, ready-to-drink tea (canned and bottled) will develop in-roads into the market. Food products which are being developed are tea-rice, tea-noodles, tea-cake, tea-biscuits, tea-wine, tea-candy, tea-ice cream.

The extraction from low-grade tea of active components, mainly polyphenols are claimed to have therapeutic properties, in tonics in China, Japan and Korea. Tea poly-saccharides are claimed to depress blood-glucose. Tea pigments and caffeine can be extracted as natural food additives. Tea saponins form surfactants and are applied in industry (Zhongmao 1996).

In particular the new types of herbal, fruit-flavor and decaffeinated teas, as well as ready-to-drink teas are becoming popular. The organically-grown and healthful image of tea can be exploited, as can the utilization of active ingredients of tea as their functional properties and nature become better known.

Ready-to-drink tea is cheaper than coca-cola derivatives and this is perceived as a main competitor. There is a risk that tea consumption may drop as other drinks come on the market, from, e.g., rice, potatoes, mulberry leaves. Diversification is the key and products such as tea chewing gum could be developed.

In summary, tea can be considered as having a share of the soft drink market, a highly competitive field. A wide range of tea products will continue to be developed through product and process development for added-value as the market shares become more sophisticated and competitive. The industry must rise to these challenges and face the future with confidence.

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Commodity Market Review 1996-97

	1991-93	1994	1995	1996[1]
	Average			
	'000 t			
World Total	2531	2543	2587	2629
Bangladesh	48	52	47	57
China	588	610	609	609
India	748	744	754	765
Indonesia	140	130	133	140
Sri Lanka	217	244	246	249
Kenya	201	209	245	250
Malawi	36	35	34	36
Tanzania	20	24	24	25
Argentina	45	42	42	41
Japan	91	86	85	86
[1]Provisional				

Exports [1]

	1991-93	1994	1995
	Average		
	'000 t		
World Total[1]	1080	1025	1056
Bangladesh	28	24	25
China	193	184	172
India	183	145	163
Indonesia	118	85	79
Sri Lanka	200	225	235
Kenya	177	184	217
Malawi	36	39	33
Tanzania	18	19	19
Zimbabwe	9	9	9
Argentina	39	43	41
[1] Excluding re-exports			

Imports

	1991-93	1994	1995
	Average		
	'000 t		
World Total[1]	1054	1028	1050
EC-15	218	217	207
Area of former USSR	145	136	169
United States	87	96	83
Australia	17	17	16
Japan	38	41	45
Iran, Islamic Rep. of	55	31	30
Syria	22	24	20
Egypt	69	57	67
Morocco	27	34	38

Pakistan	118	107	116
[1] Excluding re-exports			

Prices							
	1991-93	1994	1995	1996	1996	1996	1996
	Average			Jan-Mar	Apr-June	July-Sept	Oct-Dec
National currency/kg							
Average auction prices							
Colombo (rupees)	66	65	72	97	99	103	117
Calcutta (rupees)	49	49	54	51	62	72	53
Cochin (rupees)	38	34	42	48	46	44	43
London (pence)	114	119	104	113	114	113	115
US cents/kg[1]							
Colombo[2]	148	132	141	179	182	187	208
Calcutta	185	155	168	141	178	206	149
Cochin	145	109	130	136	132	125	120
Mombasa	154	157	130	136	142	141	150
Average[3]	158	141	140	156	157	159	169
London	190	181	164	174	173	174	179

[1] Converted monthly on the basis of average exchange rates reported by IMF[2].
Including export duties[3]. Weighted average of the four series shown

Source: Commodity Market Review, FAO Home Page on Internet, June 1998.