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THE COMPLEX CASE OF THE CHINESE TEA INDUSTRY†

The recent course of the Chinese tea industry provides an interesting illustration of the trials and tribulations of changing from a command economy to a semi-reformed free market economy. For tea it is complicated by the fact that this beverage has long occupied a very special place in the Chinese consumer economy as well as being an important earner of foreign exchange. Under these conditions, allocation of supplies between domestic consumers and foreign buyers becomes a matter of concern, made more complex by the fact that Chinese consumers prefer green tea and foreign buyers prefer black tea. China dominates the world market for green tea, but it is an important exporter of black tea as well. The question arises as to whether more Chinese tea leaf should be manufactured into black tea for export.

Total Chinese tea production is exceeded only by that of India, and China ranks as one of the world's four big tea exporters, along with India, Sri Lanka, and Kenya (Table 1).

TEA IN CHINA

Tea has always been more than a beverage for the Chinese. An old Chinese proverb says that the seven essentials in a house are firewood, grain,

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oil, salt, soya sauce, vinegar, and tea (Hunan Agricultural College, 1988, p. 1). Tea is also a symbol of hospitality and a significant component of leisure-time activity.[1]

Tea was first used as a medicine and later as a soup, before it became a drink. (In the Wei dynasty, 200–264 A.D., tea was a specific for consumption.) Not until the Yuan dynasties, 960–1279 A.D., was the present method of steaming fresh loose leaves to make a beverage adopted (Tunxi Tea Industry School, 1980, pp. 1–2).

Tea is grown in a wide range of climatic and geographical environments, from the moist rich slopes of temperate Yunnan and tropical Hainan Island to the lower hillsides of eastern China and the more severe climates in the north. The four major tea-producing provinces of Zhejiang, Hunan, Sichuan, and Anhui together account for 60 percent of national output. Fujian, Yunnan, and Hubei Provinces contribute 23 percent of the national total with Guangdong, Guangxi, Jiangxi, Guizhou, and Taiwan being the other important producers (Map 1 and Appendix Tables 1 and 2).

Two general types of tea enter the world market: black tea is fermented, green tea is not. Within both types there are many distinctions resulting from plant types, environmental conditions (climate, elevation, soils), tea garden management, the quality of plucking, and processing. Tea prices reflect both the quality associated with unique environmental conditions and the quality of field management and processing. (See Appendix.)

TEA PRODUCTION

At the time of World War I, China was producing perhaps 325 tons[2] of tea on 355,000 hectares (ha) of land, or just over 900 kilograms per hectare (kg/ha), according to figures quoted by Perkins (1969). This figure was not reached again until 1981, and yields in 1985 were still only half those reported over 70 years before. By 1949 output had shrunk to a mere 41,000 tons from 153,000 ha, implying an average yield of only about 270 kg/ha.

Tea production dropped dramatically as a result of the depredations of war and economic dislocation. In the major tea-producing province of Zhejiang, the area recorded as being planted under tea fell from 34,800 ha 1937 to only 2,120 ha in 1949. Output over the same period fell from 20,000 tons to 6,000 tons (Liu, 1983, pp. 69, 71).[3]

In terms of area planted, China now has the largest tea industry in

[1] Chinese tea legends date back nearly 5,000 years to Emperor Nong Shen.

[2] All measurements are metric.

[3] These figures must be treated with caution. Liu also reports that yields over this period rose from 575 to 3,113 kg/ha!

Table 1.—World Tea Production and Exports, 1987
(Thousand tons)

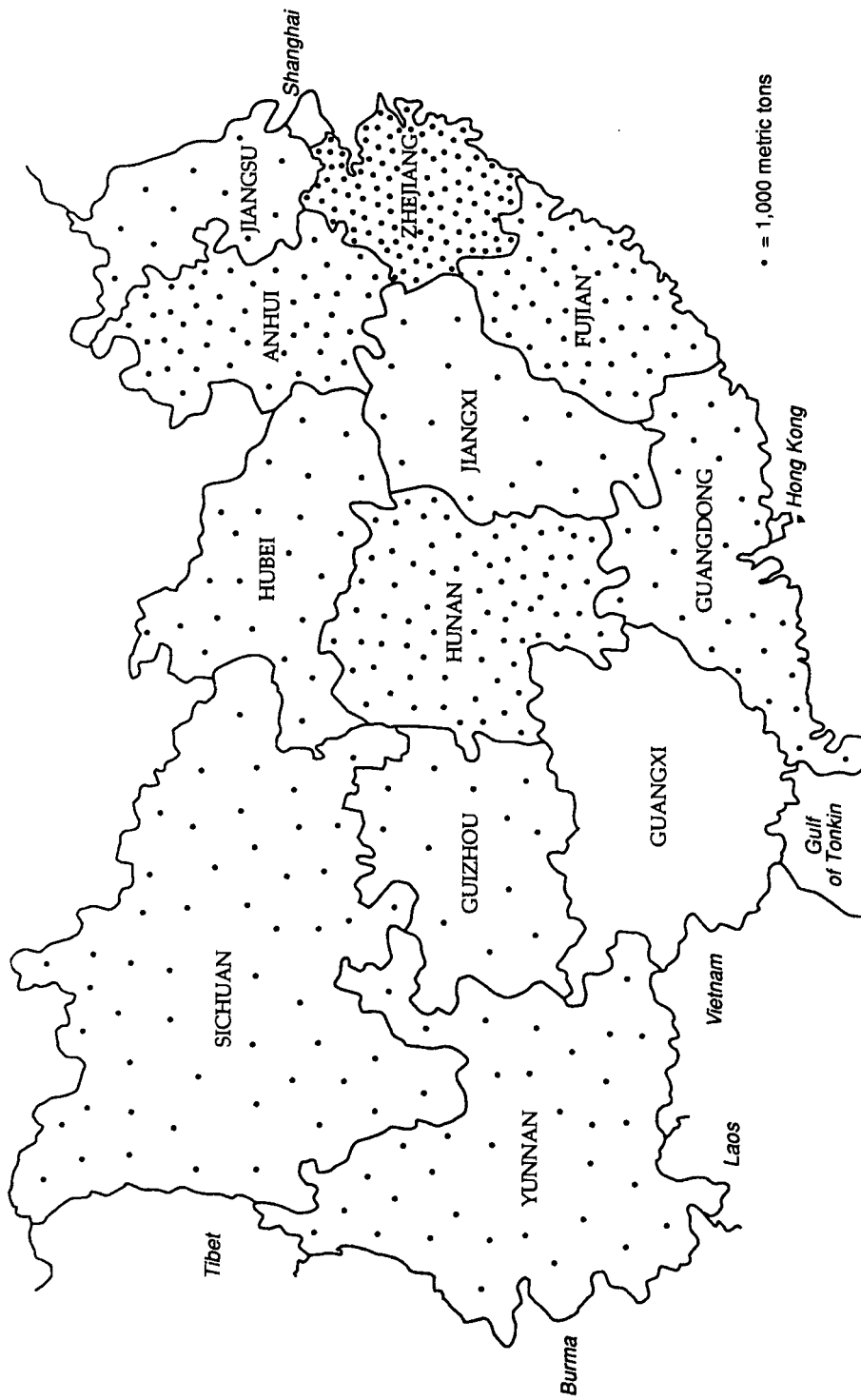
Country	Black tea	Green tea	Total
Production			
China	125	301	426
India	666	8	674
Sri Lanka	213	1	4
Soviet Union	112	28	140
Kenya	156	0	156
Indonesia	97	30	127
Turkey	137	0	137
Japan	0	96	96
Bangladesh	41	0	41
Malawi	32	0	32
Argentina	35	0	35
Vietnam	0	23	23
Others	139	26	165
Exports			
China	86	70	156
India	204	2	206
Sri Lanka	199	1	200
Kenya	135	0	135
Indonesia	90	0	90
Malawi	33	0	33
Argentina	31	0	31
Bangladesh	28	0	28
Viet Nam	0	10	10
Japan	0	1	1
Others	686	85	963

Source: International Tea Committee, *Annual Bulletin of Statistics*, London, 1988, p. 36.

the world, although it follows India in total production. China completely dominates the green tea market.

National Trends

Following the establishment of the People's Republic in 1949, the government ordered the reclamation of abandoned tea fields. Output is reported to have doubled during the period of "Reconstruction" (1949–52). At the commencement of the First Five-Year Plan period in 1953, there



Map 1.—Tea-Producing Provinces of China, 1986

were a great number of tea fields that still had not been rehabilitated. Following a major conference in December 1954, convened jointly by the Ministries of Agriculture, Foreign Trade, and the National Supply and Marketing Cooperative, renewed efforts were made to rehabilitate old tea fields and plant new ones in hilly regions. Targets were set for 1955, 1957, and 1962 (China, 1981b, p. 576).

Only the first goal was met, but the output targets established by the First Five-Year Plan were achieved successfully. During this first plan period, the operational area increased by about 100,000 ha, half of which was new plantings. However, only a proportion was in the form of dense plantings in rows—much of it was in clump planting in fragmented plots.

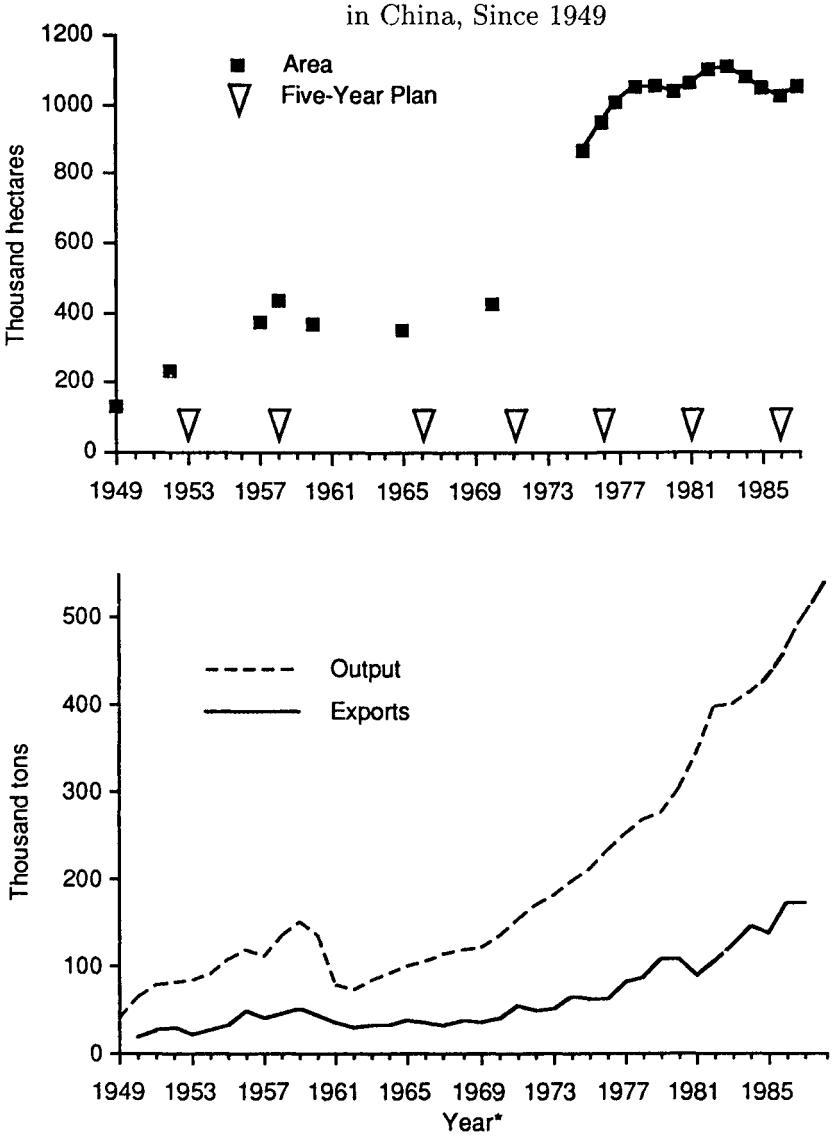
By 1958 it was estimated that over 250,000 ha still needed replanting, infilling, or severe pruning. Rehabilitation received a severe setback with the climatic and man-made disasters of the early 1960s, partly from very unfavorable weather and partly from such mistaken slogans of the Great Leap Forward (1958–59), like "the more you pluck the more will grow" and "strip the bush bare for winter." Overplucking contributed to the sharp drop in output in the following years (Chen, 1984). Total output did not attain that of 1959 until 1971. Since then progress has been steady. Old areas have been rehabilitated, and tea has been planted in many new areas.

Of the fifteen provinces producing tea in 1914, only eight were doing so in 1949. Today, 18 out of 29 provinces grow tea, although the great proportion of national production comes from twelve provinces south of the Yangtze River. The original 500 counties producing tea have been expanded to over 900 (TRI, 1986, p. 20). The total area more than doubled in the 1970s and has remained stable over the current decade. Undoubtedly, marginal tea-growing areas will be phased out in the coming years as Chinese agriculture becomes more geared to specialized commodity production. Thus in the last 20 years the industry has seen a remarkable resurgence with production doubling each decade, implying an annual growth rate of 7 percent (Chart 1). This growth has continued through changing political climes but not at an even rate. However, it seems to be based on the extensive planting undertaken during the Cultural Revolution.

Provincial Distribution and Yield Changes

Since 1979 China has published a national annual *Agricultural Yearbook* (with the first English language edition appearing in 1985) showing a breakdown of crop statistics by province. Additionally, provincial administrations have compiled and published economic and statistical yearbooks that provide further data. The tea statistics for 1979, 1984, and 1987 are brought together in Appendix Tables 1 and 2. In 1979 major production reforms were promoted with the move toward household responsibility, and in 1984 significant marketing reforms were introduced. Over this eight-year

Chart 1.—Area, Output, and Exports of Tea in China, Since 1949



* Notes: 1949-52, Reconstruction; 1958-59, The Great Leap Forward; 1960-62, Natural Disasters; 1963-65, Period of Adjustment; 1966-76, The Cultural Revolution or The "Ten Years of Disaster"; 1979, "Open Door" Policy; 1985, Market Liberalization.

Sources: China, 1985, *China Agricultural Yearbook* (in Chinese), China Agricultural Publishing House, Beijing, p. 80; China, 1986, *China Statistical Yearbook* (in Chinese), State Statistical Branch, Beijing and Hong Kong; China, 1987, *Statistical Yearbook of China* (in Chinese), State Statistical Publishers, Beijing and Hong Kong; *Beijing Review*, 7–13 March 1988, p. II; China, *China Yearbook of Foreign Economic Relations and Trade, 1984* (in Chinese), Hong Kong, pp. 916; 1985, p. 846; 1986, p. 983; 1987, p. 341.

period national output increased by 79 percent, but there were substantial differences among the provinces.

Zhejiang's 7.6 percent annual growth rate during 1979 to 1984 was achieved with a 1.6 percent growth rate in gross area and a 6 percent growth rate in yield. The second largest tea-producing province, Hunan, achieved a 5.3 percent growth rate with a 6 percent decline in area and an 11 percent annual increase in yield. It had the highest crude average yields (603 kg/ha) in 1984, but by 1987 had lost this position to the minor producing province, Jiangsu.[4] In 1914–18, Hunan produced more than half of China's tea (Gardella, 1976, p. 11). The third-ranking province, Sichuan, recorded a similar increase in yield, but a small decrease in area; its output increased very rapidly between 1979 and 1984 (about 11 percent per annum), and continued its growth to 1987. Two lesser ranking but significant provinces, Anhui and Fujian, have achieved substantial annual rates of growth in output (6 to 10 percent) with increases in both area and yield. However, in both cases yields remain well below the (low) national average. This situation may change since it is reported that much of the new planting in Fujian is densely planted with high yielding varieties.

National yield increases of nearly 8 percent per annum over an extended period are dramatic for any crop—especially for a perennial. During 1978–83 many other crops in China also showed large annual yield increases: grains, 6.1 percent; cotton, 11.5 percent; peanuts, 6.0 percent; rapeseed, 10.2 percent; and sugarcane, 4.3 percent (Lardy, 1986, p. 98). But tea yields are still very low in relation to those reported for 1914–18, comparable international yields, and tea yields reported on state farms (1,500 to over 2,000 kg/ha) and in research institutes (over 4,000 kg/ha).

In Anhui Province, for example, the average yields of about 440 kg/ha contrast with Qimen County TRI's consistent yields of over 3,255 kg/ha over the last nine years. In 1982 the Langqi State Farm reported yields of over 2,480 kg on 688 ha (Anhui, 1984). However, these yields are exceptional. In May 1989 the authors visited a number of the major tea-growing counties in Anhui. Most of the tea observed was grown on steep slopes with wide spacing between small bushes. Such fields would yield well below the provincial average and suggest that this low yield figure may well be correct. Again, in Zhejiang, TRI has attained peak yields of over 5,500 (Yao and Ge, 1986), while the Hangzhou Experimental Tea Estate (actually a state farm in Yuhang County) had yields of 2,628 kg in 1976 (Phipps and Perry, 1977), while in 1986, a bad year, the yield was still 2,040 kg/ha on

[4] Yields should be calculated with respect to the mature area rather than the total area. The area under tea in 40 percent of the provinces declined over the period, and some of the increases in area are rehabilitated rather than new fields. Published statistics on mature areas of tea fields do not cover the whole period 1979 to 1987.

a production area of 365 ha (Author's field notes, May 1987). State farm yields for China in 1986 averaged over 1,000 kg/ha, and ranged from over 2,100 in Zhejiang and Anhui to only 422 kg/ha in Jiangxi. Three-quarters of the total area of state farm tea fields (43,300 ha) was classed as "mature" in 1986 (China, 1987b, p. 305).

China's average tea yields are indeed very low as shown in Table 2.[5] Comparison with India is dramatic, and it is made even more so by the fact that it takes only 4 kg of leaf to make 1 kg of green tea, China's principal product, and 4.5 kg to make 1 kg of black tea, the principal form produced in India.

Kedi Shen and Liming Wang (1987) contend that national yields, presumably of mature bushes, have remained constant at about 465 kg/ha since 1949. A troublesome aspect of the question of tea yields is the accuracy of area statistics. Output figures are believed to be fairly reliable, but the area actually planted to tea may be overstated. Official figures may record a tea garden of 100 ha, for example, whereas only 80 ha may actually have been planted (Discussion at Zhejiang Agricultural University, September 1988).

In 1973, Zhejiang Province initiated a survey to determine how much land was actually planted to tea. By 1980, 45 of the 58 tea-producing counties had been surveyed. Overall, land area under tea was reduced by 12.3 percent. Three counties were found to have only 50 to 60 percent of the area they had reported. (It was alleged, however, that the survey had been rushed and would have to be repeated (Hu, 1980, pp. 8–9).) No other tea-growing province has reported having undertaken such a survey, nor do many have as good facilities to do so as relatively advanced Zhejiang.

China produces a wide variety of teas (Table 3). The most rapid increases in production have been in Wulong (oolong), green, and compressed teas. Black tea production has also increased substantially during the eight years prior to 1986 from 70,000 to 124,000 tons (TRI, 1986).[6]

Two conclusions can be drawn from Table 3:

1.) The contrast between total areas and mature areas suggests that new and immature areas are very large (about 200,000 ha or 20 percent) and implies that output could continue to expand rapidly. Even if average mature yields remain constant, China's production will certainly exceed 550,000 tons by 1990.

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[5] The whole question of the accuracy of Chinese statistics is a thorny one, but its proper discussion lies outside the range of this paper.

[6] Compressed tea is a semi-fermented tea that is compacted into a "cake" or "brick" for convenience of transportation, storage, and trade. The consumer breaks or cuts off sections of the brick and infuses it in boiling water, often adding butter and salt. This type of tea is very popular with minority ethnic groups in the border regions of China.

Table 2.—International Tea Yields in 1985

Country	Total output, 1985 (000 t)	Total area, 1982 (000 ha)	Average yield (kg/ha)
China (1986)	463	1,104.7[a]	419
India	659	395.0	1,668
Sri Lanka	215	242.1	888
Soviet Union	155	78.7	1,970
Kenya	147	81.1	1,813
Indonesia	132	109.5	1,205
Turkey	123	64.5	1,907
Japan	96	61.0	1,574
Bangladesh	43	44.7	962
Malawi	40	18.5	2,162
Argentina	33	41.4	797
Vietnam	22	49.6	454
Total	2,105	2,282.8	922

Source: Calculated from International Tea Committee, 1986, *Annual Bulletin of Statistics* and *Supplement*, London.

[a]1983.

2.) The growth potential is widespread with six provinces having immature areas of between 16,000 and 40,000 ha. The largest increase in mature areas since 1982 is in Fujian Province (nearly 20,000 ha), while Yunnan still has an immature area of nearly 40,000 ha.

If mature yields actually rise and the 7 percent growth rate is maintained, China will regain its premier status in world tea production before the turn of the century. (Unfortunately, China production statistics do not report areas withdrawn from production, information necessary if accurate forecasts of output are to be made.)

POLICY REFORMS AND THEIR IMPACT

Since the end of China's closed door policy and the reorientation of its economy to the outside world, as well as a shift from central planning to the use of market forces to guide production and distribution, the tea industry, like many other cash crops in the agricultural sector, has entered a qualitatively new period of expansion. Starting in 1978, the 20-year old collective agricultural system has been replaced by household-based farming where a contract responsibility system links efforts with reward and allows individual farmers to establish and develop their own businesses.

Table 3.—Chinese Tea Production by Variety, Area, and Yield by Province, 1986

Province	Green	Black	Wulong	Compressed	Other	Total
By Variety and Province (Thousand tons)						
Zhejiang	93	11		19		104
Hunan	17	36	—[a]	11	11	73
Sichuan	16	19			17	52
Anhui	39	8				47
Fujian	22	2	19		1	44
Yunnan	18	14		1	—[a]	34
Guangdong	9	11	4			26
Hubei	10	5		6		23
Jiangxi	11	4				16
Guizhou	5	3		—[a]	5	12
Guangxi	4	6	1	1		12
Jiangsu	5	5	—		[a]	11
Others[b]	7				6	
National	257	124	24	19	37	460

	Area (000 ha)		Yield (kg/ha)	
Province	Total	Mature	Total	Mature
Area and Yield by Province				
Zhejiang	173	150	604	694
Hunan	109	96	669	761
Sichuan	105	80	496	655
Anhui	116	97	404	485
Fujian	120	94	369	468
Yunnan	121	80	281	425
Guandong	47	36	550	717
Hubei	67	52	344	446
Jiangxi	60	44	263	360
Guizhou	28	22	436	552
Guangxi	20	15	566	752
Jiangsu	14	11	745	975
Other[b]	43	26	1,211	1,226
National	1,024	804	452	573

Source: Calculated from China, 1988, *China Agricultural Yearbook 1987* (in Chinese), Beijing Agricultural Publishing House, Beijing, p. 234, and China, 1988, *China Statistical Yearbook* (in Chinese), State Statistical Bureau, Beijing and Hong Kong, p. 168.

[a]Less than 500 tons.

[b]Henan, Shandong, Tibet, Gansu, and Shaanxi.

Managerial Reforms: Production Systems

From 1958 to 1978, Chinese farmers worked under the direction of local officials who managed a three-tiered collective structure divided into communes, brigades, and production teams. It was believed that this structure would enable "faster rates of accumulation and investment, better management of land and labor, greater responsiveness to state planning . . . [and promote] technical improvement" (Watson, 1987, p. 1). Workers were paid in work points, calculated quantitatively and distributed in kind and cash at the end of each season. With a Maoist-inspired ethic of collectivism, selflessness, and sacrifice constantly instilled into the population, there was a great tendency, often encouraged by local officials, to distribute the proceeds of labor as equally as possible. This form of labor management and income distribution led to endless disputes and greatly reduced incentives to work hard. "While income distribution within units was relatively equal, regional inequalities became entrenched" (Watson, 1987).

Enormous changes have taken place in the management of agricultural holdings since 1978. The communes have been broken up and a wide range of alternative household responsibility systems is evolving (see, for example, Watson, 1984; Lardy, 1986). Some villages (formerly brigades) have retained decisionmaking for tree crops. In others all farming decisions have devolved upon individual households. Thus, at one end of a complex spectrum, there are individual farm households and, at the other end, state farms. Most typical is the household supplemented by collectively owned village assets. Land was generally allocated to each family on a per capita basis, 70 percent according to Watson (1987, p. 9).

By 1987, 80 percent of the tea fields were contracted to households and the rest to specialized teams of households (Huang, 1987, p. 5). The size of the tea garden operated by each farmer is generally very small. In 1983 Zhejiang's Zhuiji County, which is considered to be a rich tea district, produced 6,000 tons from nearly 8,500 ha, or 710 kg/ha, somewhat above the provincial average of about 600 kg/ha. Two specialist tea-producing households each operated 2 ha of tea. In Wuyi County reference is made to 280 tea households operating a total of 22.13 ha—less than one-tenth of a hectare per family. Another group of 30 families in the same county handled 7.8 ha or one-quarter of a hectare per family. Mini-tea gardens are seen as a serious problem, and specialized tea farms are viewed as a model for consolidation. The tea-processing factory manager from a county in Zhejiang Province was probably expressing a widely held view when he stated early in 1988 that small gardens managed by households and individually run crude processing factories were not beneficial to the industry (*Zhejiang Daily*, January 28, 1988, p. 4). Tea farmer associations are being encouraged.

Information is becoming available about the contribution of various

producer subsectors to total output. State farms are reported to have produced 26,000 tons of tea in 1984 (China, 1987b, p. 187). Two years later, the figure had risen to 35,000 tons (p. 305), 8 percent of national output. Total state farm tea area in 1986 was 43,337 ha (about 4 percent of the national area) of which only 31,944 ha were mature. The implication is that the increase in production over the two-year period is likely to continue as immature areas come into production. The average mature yields of 1,095 kg/ha reported are about twice the overall national yields, but there is great variability between provinces. Of the larger producers, Jiangxi, with nearly 5,000 ha of mature tea in state farms has yields of only 422 kg/ha, while, with less than half this area each, Zhejiang and Anhui have yields of over 2,000 kg/ha. Personal observation in Zhejiang suggests that returns on the state farms are closely linked to effort under a contract system that rewards and penalizes success or failure in meeting output levels with little regard to quality.

The state farm sector has also been involved in the management reform program. An account of these reforms on a state farm in Guizhou Province describes the division of this large-scale unit into family farms in 1985. Each family signs a contract with the farm leadership and is in turn assigned tasks for the forthcoming year. Responsibility for profits and losses devolve upon the contractee, and agreement is entered into for area, output, value of production, costs and profits (Hu, 1987, p. 37).

Specific information on the impact of the reforms on the tea sector is not available from national statistics. However, it can be assumed that these reforms were a major contributing factor in the remarkable acceleration of output from 1979 to 1982 (see Chart 1). The collapse of this rapid growth in 1983 was the external indication that all was not well; in fact increases in output were not matched by increases in sales. Major areas of concern were the processing and marketing sectors.

Managerial Reform: Tea Processing

It is not only in terms of farm output that the reforms will have an impact. Their effect on tea processing, on how "green leaf" supplied by farmers is transformed into "made tea" for sale to consumers is important too.[7] There are many different processing techniques, each of which can have subtle regional and local variations. The processing scene is complex. Major changes in methods of processing were instituted during 1958–78, and the 1979 reforms have also affected tea processing and farmer-processor relationships.

Black tea is processed in the conventional way: green leaf is delivered to a factory that directly processes this leaf into a finished product that is sold

[7] Green leaf is a highly perishable. The processing needs to be started within about four hours after the leaf is plucked.

in bulk tea chests for possible further grading, blending, and packaging for export. With green tea, the green leaf is typically taken through an initial processing stage on the farm. This farm-level processing is aptly called "crude processing." Here the fresh green leaf is roasted in a semi-spherical pan (or wok), that is heated by electrical elements over a fuelwood oven. With a moisture content of about 6 percent, this crude or semiprocessed tea is sold so that the second stage of refining can be undertaken. Refining is again an apt description for this process of re-drying, grading, blending, and packaging. For Chinese green tea, this is the true factory stage. It is here in particular that there has been a revolution in technology over the last 25 years since it is now estimated that 70 percent of all refineries are mechanized.

However, not all the refining functions are necessarily undertaken in one factory; indeed, typically they are not. Furthermore, some green tea is never refined but is sold directly as crude tea. Official statistics (Ministry of Commerce, 1987b, p. 300) report a total of 306 refineries, half of which are in the "over 500 ton" category. Some are very large, such as the Hangzhou Tea Factory which handles over 5,000 tons per year.[8] Sixty-three percent of the national output is accounted for by these official factories, but this includes black tea factories. The authors calculate that over 50 percent of green tea is accounted for by these refineries. The Tea Research Institute estimates that there are in fact about 8,000 factories undertaking some refining functions (Personal communication, TRI, May 1987). The implication is that the true average size of green tea factory in China is extremely small.

Case studies in an article entitled, "An Inquiry into the Responsibility System in Crude Processing Factories" (Hu, 1984, pp. 36, 37), suggests that very small factories may indeed be typical, certainly in the Zhejiang Province. In the one case for which adequate figures are given, a factory handling only 19 tons is mentioned, and it is implied that the other four factories were of similar size. This conforms with the authors' fieldwork observations.

Ping Hu further reports five different processing arrangements under the responsibility system. First, there is a direct purchase system in which the green leaf is sold to a factory that pays according to the quality of the leaf. In some cases farmers retain an interest in the made tea since if additional profits are made the farmers obtain a bonus payment. Under the joint processing system farmers are only paid after the made tea is sold and

[8] The size of state factories (500 tons) might be considered within the normal range of factory size by international standards although more typical factories handling smallholder tea in Kenya, for example, are twice to five times this size (Kenya Tea Development Authority, 1987). Thus, factories with capacities of only 40 tons per year must be considered to be extremely small.

the factory has deducted the costs of manufacture. There is also a contract system under which the factory returns the tea to the farmers after processing, and they are responsible for selling the crudely made tea. There is also a system whereby households take it in turns to do the processing using communally owned equipment. Finally, there is processing by individual households. Zhifang Yan (1986) suggests that while field management and rewards for tea growing must remain with individual farmers, collaborative arrangements are required in establishing and maintaining green leaf standards in processing, sales, and trading accounts.

On June 16, 1980, the State Council issued a notice specifying that tea-refining factories could remit profits from their processing to communes and brigades. After setting a base figure and a surplus amount to hand over to the state, most of the profits from processing could be retained. It could be divided between the enterprise and agricultural collective, or the factory could be run as a joint enterprise, or profits could be distributed on the basis of procurement quantities. Specific methods of distribution and the proportions involved were left to the discretion of provincial authorities (Commerce Research Institute, 1984, pp. 392–93).

Anhui Province proposes to establish a chain of basic processing plants, each of which will specialize in a stage of the total process (Anhui, 1984, p. 208). However, where tea is still processed by hand, given the size of the roasting bowls, there appear to be no economies of scale in initial (crude) processing. Thus in the Longjing-producing area around Hangzhou, the skilled roasting of the tea in electrically heated bowls or woks has reverted to the homestead, and the large halls that were used by the communes are filled with rusting equipment (Personal observations, 1987, 1989).[9] For steamed green tea and black tea, on the other hand, there are substantial economies of scale in the total processing system.

The very large number of small-scale tea-processing plants using crude equipment implies major problems of maintaining consistent quality. This became apparent with the flood of poor quality compressed tea into border areas. In 1985, 40 percent of sales in Xinjiang came from such plants, effectively cutting out higher quality and higher priced teas produced by state factories (Ministry of Commerce, 1986b, p. 226). In 1986, actual quality of crude tea dropped by one grade or two sub-grades, or in some areas by two grades. This was attributed to tightness in supplies, forcing buyers to raise notional grades, and thereby prices, to procure tea. Additional reasons were the continued irrationality in official prices, even though tea farmers obtained an average of 40 percent more than in the previous year, and the

[9] In seeking new models for the integration of household production systems with larger scale processing units, much could be learned from the experience of the Kenya Tea Development Authority. For an early discussion, see Etherington (1971) and also World Bank (1982).

lack of quality supervision (p. 303). Rationalization and amalgamation of factories are likely to be encouraged as transport facilities improve, and as prices more clearly reflect quality differentials. A recent report from Taiwan indicates that tea technicians are crossing the Straits to work as consultants for mainland producers, so as to introduce modern technology to the industry (*Free China Journal*, 1988, p. 3).

MARKETING

Price policy changes have had an impact on legally marketed production. After 1965 the government encouraged tea production through a pricing policy that rewarded above-quota sales. The results of this reform were said to have become evident quickly (Guangxi, 1985, p. 236), but statistics do not show any perceptible increase in output until 1970. In 1979 the state raised procurement prices for crude tea from 105.82 yuan[10] per 50 kg to 125.92 yuan (Commercial Research Institute, 1984, p. 557). By 1985 average procurement prices had risen to 212.1 yuan to 50 kg only to fall back sharply to 170.8 yuan in 1986 (China, 1986a, p. 552; 1987a, p. 664).

The National Supply and Marketing Cooperative, with branches across the country, formerly held a monopoly on buying and selling. Between 1952 and 1982, it consistently purchased around 90 percent of the tea crop (Commercial Research Institute, 1984, p. 491). During this period and to present, the relative price of tea has risen (Table 4).

Table 4.—Price Parity Ratio of 100 Kilograms of Raw Tea and Selected Commodities

Commodity	1952	1957	1978	1984	1986
Salt (kg)	340	462	747	888	1,181
Granulated sugar (kg)	75	115	152	161	223
Plain white cloth (m)	119	177	248	219	287
Matches (100 boxes)	50	85	110	112	117
Kerosene	78	141	298	365	482

Sources: China, 1985, *Statistical Yearbook of China* (in Chinese), State Statistical Bureau, Beijing and Hong Kong, p. 541; 1987, p. 662.

The state fixed area and crop quotas and enforced a uniform procurement policy to obtain rural products for the urban population and the

[10] The official exchange rate with the U.S. dollar has been fixed at Renminbi (RMB) 3.72 yuan.

export market. It determined wholesale and retail prices based on procurement prices, allowing a certain margin to take account of various production, distribution, and other costs. There was little interaction between producer and either seller or consumer, little price differential for quality products, and little price recognition of consumer choice and market demand (Donnithorne, 1967).

Beginning in 1980, steps were taken to reform this over-centralized and rigid marketing system as it applied to agriculture in general (Watson, 1988) and to the tea industry in particular. In that year, the government decided to reward above-quota sales by paying increased prices and lowering tax rates. However, this resulted in the blind pursuit of quantity to the neglect of quality. In 1981 and 1982, output increased 12.8 and 15.7 percent, respectively. Consistent anecdotal evidence suggests that quality has declined over the last decade.

The government has also become more active in its use of taxation policy to reorient the industry. For example, in a State Council notice of April 24, 1981, it was decreed that the industrial and commercial tax rate on above quota purchase of crude tea (not including broken black and border tea for ethnic minorities such as Tibetans and Mongolians whose tax had been reduced to 20 percent in 1980), was to be reduced from 40 percent to 20 percent and the saved funds to be handed over to tea production units. On April 20, 1983, in a circular jointly issued by the Ministry of Commerce, the Ministry of Finance, and the State Prices' Bureau, it was decreed that the industrial and commercial tax on crude tea was to be reduced from 40 percent to 25 percent, for border tea from 20 percent to 10 percent, and the tax rate unified on all refined teas, such as broken black, congou (gongfu) black, green, scented, and Wulong, at 15 percent. The aim of this measure, and it was specifically mentioned in the circular, was to reduce prices so as to clear out the enormous stockpile of tea accumulating in state warehouses.

A notice from the Ministry of Commerce and the State Prices' Bureau of 27 May of the same year specified the reduced prices. The ex-factory/wholesale price differential was to be reduced to 15 percent and the wholesale/retail differential to below 20 percent. The tax rate on the raw material for border tea was to be reduced from 20 to 10 percent. The industrial and commercial tax is not the only tax levied on the industry. For example, Zhejiang levies a special product agricultural tax of 8 percent on tea, whether it be spring, summer, or autumn tea (Zhejiang, 1986, p. 75).

Production had increased rapidly in the late 1970s–early 1980s, but sales were sluggish, and reserves built up to unacceptably high levels. In 1983 production rose by only 1 percent over the previous year, the lowest increase in 20 years, and overstocked tea warehouses led to procurement

agencies refusing to buy more tea. National reserves increased by 11,500 tons in the same year, so that warehouses held a total of 274,790 tons, enough for two years' normal sales (Ministry of Commerce, 1986b, p. 316). An additional 100,000 tons was held at export ports (1986b, p. 223). In Zhejiang Province reserves in 1983 totaled 60,000 tons, 10 percent more than the national output increase for the same year (Song, 1984, p. 45). This in turn led to peasant resistance to go on increasing output. For example, in Zhejiang Province, between 1982 and 1985, 6,066 ha of tea fields fell into disuse and were lost to production, leading to a drop in provincial output for three successive years (Zhejiang, 1988, pp. 136–37).

In 1983, the buying agencies in Anhui Province attempted to restrict their purchases to spring and fine grade teas and discontinued their policy of reducing taxes and increasing prices for above-quota sales. Peasant resistance to these moves resulted in falls of 5.9 percent in provincial output and 13.8 percent in state procurements. Quality, not quantity, appeared to be the goal.

One of the principal causes of consumer resistance, particularly in rural areas, related to the increased retail price of tea, brought about largely by the practice of state buying agencies "high-grading" their purchasing in order to mask actual price rises. With supply short of demand until the early 1980s, the agencies were forced to resort to this practice to secure supplies and meet state targets. If buyers tried to follow quality guidelines, producers complained of prices and grades being squeezed. Consumers at the end of the distribution system were thus faced with buying, say, fourth grade tea at second grade prices. Sample inspections in 1984 confirmed that assigned grades were two grades above stipulated grades.

Coupled with an overstocking of supplies (particularly in medium- and low-grade teas grown on hillsides and plains rather than on mountains, and plucked in summer and autumn rather than in spring), high but unsatisfied demand and a tea consumption level very low by historical Chinese standards, the authorities turned to market liberalization as an answer.

The major marketing reform for tea occurred when Document 75 of the State Council was released on June 9, 1984. This followed the more general agricultural marketing reforms of the previous year (Ministry of Commerce, 1986a). Apart from compressed tea produced and sold to minority nationalities living in the border regions of Tibet, Xinjiang, and Inner Mongolia, whose supply was guaranteed by the continuation of the existing state-controlled procurement and marketing system, the market for domestic and export sales was relaxed and opened up by a radical series of measures.

Document 75 and other important documents previously released in February and May 1983 catalogued a series of problems in the marketing and distribution of tea: excessive planning throughout the system, unified

list prices, fixed, monopoly marketing channels involving too many linkages, and production for its own sake, to the neglect of quality and sales. The consumer faced a market where retail outputs were few and inconvenient. Prices of second-rate teas were unreasonably high, and good quality teas were either unobtainable or sold out very shortly after reaching the market. Export prices failed to match the cost to the Chinese of placing their teas on the international market.

Five solutions to these problems were proposed in Document 75:

1.) To open up and commercialize the marketing of tea so that companies combining production and sales could be established. Producers would be made aware of market trends and would orient their production accordingly. Sales departments would offer consumers attractively packaged quality tea at an appropriate price, and provide producers with market and technical information. Economic linkages rather than administrative divisions would determine the flow of goods. Traditional retail outlets such as tea and wine houses, public bathing facilities, and restaurants were to revive the custom of selling tea, and an advertising campaign would promote the health and lifestyle benefits of tea.

2.) To utilize the existing supply and marketing cooperatives as the principal marketing agent, and contacts for the benefit of producers, sellers, and customers. Negotiated prices were to replace fixed prices, and the price of tea was to be allowed to float within specified limits. Changes were swift in 1985, the year after the reforms, and the share of total procurements obtained by the state marketing cooperatives fell from their past 30-year average of about 90 to 65 percent.

3.) To allow the signing of export contracts of different durations and to allow provincial-level foreign trading companies to sign contracts and export directly themselves (see *The Economist*, 1988, p. 20).

4.) To establish a guaranteed floor pricing structure to ensure tea producers an income and motivate them to invest in a crop that does not bring an immediate return.

5.) To limit state procurement of tea at fixed prices to specialist compressed tea for minority groups.

In 1988 the reforms were only in their fourth year of implementation, but results were encouraging, despite accompanying problems. Production and export figures were up, as mentioned above. Sales increased by 8 percent in both 1984 and 1985 and by 8.6 percent in 1986, while reserves fell 17,900 tons in 1984 and a further 328,000 tons in 1985. The 1985 spring tea reached the retail market a month earlier than in previous years. Prices rose for higher grade teas and dropped for lower grades. In August 1985 the Ministry of Commerce, the State Prices Bureau, the State Standards Bureau, and the State Industrial and Commercial Administrative Management Bureau jointly convened a conference on quality and prices that was

attended by principal tea companies from tea-producing provinces. It recommended that prices for 1986 be allowed to float up to 10 percent above the list prices released in 1983; guidance pricing had been introduced.

The Ministry of Commerce and the State Prices Bureau jointly issued a notice on March 6, 1986, setting out guiding prices for the coming 1986 season (1987, p. 50). In 1986, prices in Zhejiang Province rose on average 20 percent over 1985, and because of the more open field for competition in a market where demand exceeded supply, the struggle to obtain the leaf drove prices up further (Huang, 1987, p. 6). For green tea, in the spring of 1986 competitive buying led to a shortage of material for the export market (Ministry of Commerce and State Prices Bureau, 1987, p. 297). In March 1988, at the commencement of the new season, the Zhejiang Supply and Marketing Cooperative issued a circular setting guiding procurement prices at 16 percent above those of the previous year, with a 5 percent allowance for price floats and an above average increase for medium- and low-grade teas (*Tea News*, 1988, p. 1).

In fact, Chinese teas now come under three pricing systems: for minority areas the state sets mandatory prices; for export and domestic black, green, scented, and Wulong, there are contracted and floating prices; and for famous and fine quality teas, the market sets the price (Ministry of Commerce, 1987b, p. 298). Marketing of tea is carried out by tea companies and factories working together, by the supply and marketing cooperative monopoly system, or by decentralized competition (p. 223).

In 1987 the struggle to secure supplies erupted into all-out "war."[11] Reports from Zhejiang provide fascinating details about this tea war in the province. On May 16 of the same year the relevant authorities of Zhejiang Province issued an urgent circular calling on all those authorized to buy tea to ensure the fulfillment of export contracts (*Zhejiang Daily*, May 17, 1987, p. 1). The circular of May 16 had little effect. A further *Zhejiang Daily* article graphically detailed the scramble to purchase tea from producers by individual and state buyers, both from within the province and by outsiders, with the resultant exorbitant rise in prices and losses to processors and exporters (*Zhejiang Daily*, June 4, 1987, p. 1). Procurement targets for exports could not be met, and counties moved into open confrontation to protect their supplies. Within counties, village battled village and tea

[11] Tea has not been the only cash crop to experience this phenomenon. Other crops including wool, silk cocoons, cotton, rabbit furs, ramie, tobacco, and sweet potatoes have been at the center of a mad scramble by purchasers to get hold of them (Watson, Findlay, and Du, 1988, for wool; *Zhejiang Daily*, May 23, 1988, p. 1, for the silk war between Zhejiang, Jiangsu, Sichuan, and Anhui Provinces where a local official in Zhejiang attempting to fulfill planned procurement targets was assaulted by buyers from outside the province trying to buy silk cocoons; and *Outlook Weekly*, 1988, p. 5).

factory and supply and marketing cooperative within the same village battled each other for the precious commodity, leading to raids on each others' supplies. Violence erupted on occasion. (See the account of the assult on three officials from the taxation department who apprehended two peasants buying tea without a licence (*Zhejiang Daily*, May 17, 1987, p. 1).) One tea refinery offered a price 60 percent above the referred price, even though it was operating at a loss and then sold the tea to other processors.

The *Zhejiang Daily* reporter concludes the article by reminding readers that in 1983–84, when sales were flat, output of tea in Zhejiang dropped by 15,000 tons (in 1982 provincial output was 107,600 tons, and by 1985 it had fallen for the third successive year to 93,150 tons). With the market out of control and prices soaring, it clearly is feared that exports will be priced out of the market or sold at an unacceptably high loss and the domestic consumer will be turned away from the product once again.

In 1988, clearly worried by this turn of events, the provincial authorities in Zhejiang acted decisively to try and prevent a repetition of the events of the previous year. At the instigation of the provincial tea import and export company, the Zhejiang Tea Industry Group was established, comprising 108 members engaged in production, procurement, processing, export, research, and teaching in the tea industry. The group formulated a series of self-disciplinary regulations to control the behavior of each of its constituent members and linked up with local governments and supply and marketing cooperatives to bring some order back into the market. In order to guarantee the supply of fresh leaf for processors with foreign contracts, the group allocated 3,000 tons of scarce chemical fertilizer to tea farmers. The group also made cash advances to the processors with five months' interest on the advance, assistance in registering with the health department and in improving their methods of operation (*Tea News*, 1988).

The problem of declining quality remains a major worry. In 1986 the Tea and Livestock Bureau of the Ministry of Commerce set up inspection teams to check on quality. Quality fell nevertheless, but not as much as anticipated! Crude tea was one grade (two divisions) below that of the previous year. Inspections revealed that only 16 percent of black, 8 percent of scented, and 10 percent of green tea was fully up to standard (Ministry of Commerce, 1987b, pp. 302-03). Domestic and international commercial houses, tea experts and consumers, and Chinese processors continually comment upon this issue. Price reforms have only gone part of the way to alleviate the problem.

Increasing price differentials encourage the supply of spring as against summer and autumn teas, high grade vis-a-vis medium and low grades, and new against old teas. For example, between 1984 and 1985 the domestic retail price of special grade tea from Fujian Province rose from 760 to 979 yuan per 50 kg, while that of sixth grade scented fell from 350 to 214

yuan. In the same period, the retail price of the special first grade of the famous Longjing green tea from the West Lake district of Hangzhou shot up 133.3 percent from 27 to 63 yuan per 500 grams, but dropped percipitately in 1986 (Ministry of Commerce, 1987b, p. 298). For Longjing eighth grade, the price fell from 2.71 to 2.50 yuan. However, the stimulus to producers to concentrate on fine quality teas may have reduced production of average grade teas and may bring about a further dilution of such teas as Longjing in places far away from their traditional production area. How will connoisseurs of Chinese tea overseas respond to the marketing of Longjing green tea produced in Sichuan Province?

The Tea Research Institute in Hangzhou has been invited by the Food and Agricultural Organization to define international quality standards for green tea (such standards already being in place for black tea). It is clear that the establishment of such standards is also necessary for the domestic market.

Domestic Consumption

As the relative price of tea has risen over recent decades, so has per capita consumption, from 70 grams per capita in 1965 to 320 grams in 1986 (China, 1987a, p. 711), perhaps reflecting an increasing prosperity. Nevertheless, Chinese tea consumption is still low compared with that in other countries where tea is the preferred beverage (Table 5). Of particular interest are consumption levels in Hong Kong, Taiwan, and Japan. If China does indeed maintain a per capita growth rate in incomes of 8.5 percent (World Bank, 1987, pp. 204, 254), if the income elasticity of demand for tea is 0.7,[12] then the rate of growth of demand for tea would be 7.25 percent per year. This in turn implies an increase in domestic demand from 300,000 tons in 1985 to 890,000 tons at the turn of the century. At this level, the per capita consumption (with a population of 1,270 million) would be 0.70 kg, a figure that is certainly not unreasonable. A recent estimate predicts that domestic consumption will reach 450,000 tons by 1990 (with an annual growth rate of 8.5 percent from 1985).

The level of consumption varies tremendously across China. For example, Shandong and Henan Provinces have similar populations and levels of economic development, but consumption in the former is eight to ten times that of Henan (Ministry of Commerce, 1986b, p. 316; Shen and Wang, 1987, p. 8). The development of drinks, sweets, and other food items using teas as a base, as well as the use of tea in shampoos, as a food preservative, and as an anti-oxidizing agent also helps increase consumption levels.

[12] This guess is very modest compared to the World Bank's estimates of .25 for Indonesia, .5 for Saudi Arabia, .76 for Syria, .95 for Pakistan, .98 for Egypt, and over 1.3 for India (World Bank, 1986, p. 52).

Table 5.—Apparent Consumption of Tea in Selected Countries (*Kilograms per capita*)

Country	1977-79	1982–84	Country	1977-79	1982–84
France	.12	.15	China[a]	.16	.32[b]
Germany	.21	.25	Hong Kong	1.76	1.73
Netherlands	.65	.66	India	.50	.53
Poland	.53	.71	Iraq	.97	2.69
U.K.	3.14	3.06	Japan	.97	.91
Soviet Union	.56	.75	Pakistan	.80	.90
			Sri Lanka	1.50	1.43
			Taiwan[c]	.60	.65
United States	.37	.35	Turkey	1.98	1.98
Chile	1.16	.93			
Egypt	1.30	1.44	Australia	1.66	1.39
Kenya	.74	.77	New Zealand	2.38	1.92
Tunisia	1.46	1.61			

Sources: International Tea Committee, *Annual Bulletin of Statistics*, London, 1987, p. 105.

[a]China, 1987, *China Statistical Yearbook* (in Chinese), State Statistical Bureau, Beijing and Hong Kong, p. 711.

[b]1986.

[c]Estimated from Food and Agriculture Organization, Committee on Commodity Problems, June 1986, "Tea: Current Situation and Short-term Outlook," Rome, p. 4.

The Tea Research Institute is currently working on such products for the Chinese market (Discussion, TRI, August 1988).

The implications of these modest speculations are that China does indeed need to continue to increase the yield of its tea-growing areas to avoid upward pressures on domestic tea prices. If the area under tea does not change from current levels, and export volumes stabilize at about 200,000 tons, then yields by the turn of the century need to be somewhat over 1,000 kg/ha. This is a large but not impossible task; it implies an annual growth rate in yield from 1985 of about 6 percent. As we have seen, many state farms are already achieving yields well in excess of this level. The problems for the industry, however, may not only be in achieving this yield but in obtaining sufficient skilled labor to harvest the output because, unlike most other tea-producing regions of the world, production in many of the major provinces is highly seasonal and competes with other farm activities.

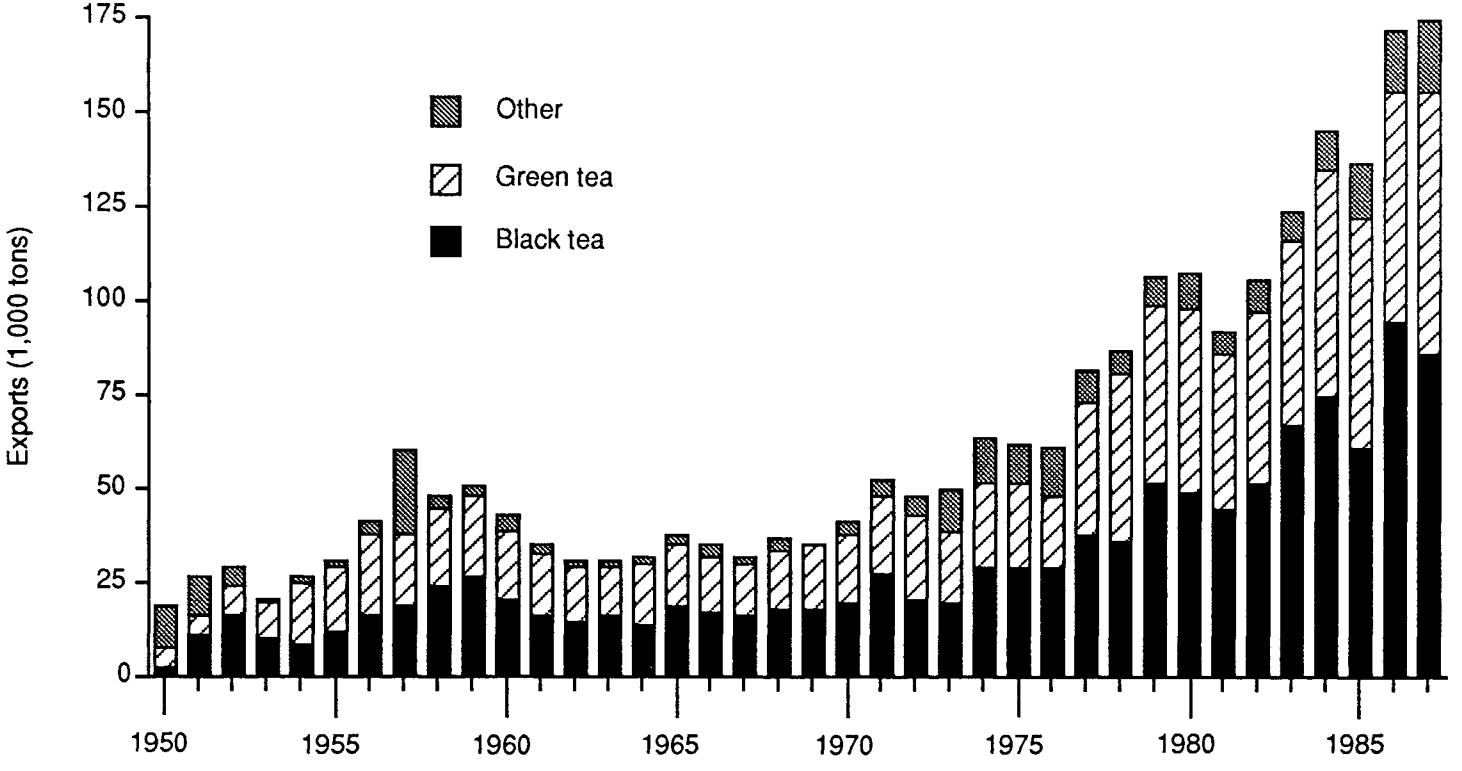
China's International Tea Trade

The export of tea from China has a long and turbulent history. Until the late nineteenth century, China virtually monopolized the world tea market providing 86 percent of world supplies as recently as 1871. Tea was the prime export during the early years of China's seaborne trade with Europe and North America. This trade built up rapidly in the latter part of the eighteenth and early nineteenth century and peaked in 1886. China's principal customer was the United Kingdom until the 1880s, when the U.K. began to withdraw from the China market and buy tea from the plantations it had established in India and Sri Lanka (then Ceylon) during the previous two decades. Russia compensated for the loss of Britain as a customer until the outbreak of the Russian Revolution brought that trade to a temporary halt in 1918 (Torgasheff, 1926, chs. 27–29). The fortunes of the industry since then have fluctuated as widely as those of China's domestic and international politics. Since 1970, however, tea exports have expanded in a consistent and impressive fashion (Chart 1).

Of total world tea production of over 2.25 million tons, 75 percent is black tea. About 57 percent of black tea is exported, but only about 16 percent of green tea. China ranks third in total tea exports (of black and green teas), contributing 17 percent of world tea exports in 1986, up from 14 percent the previous year. In 1987 China produced 62 percent of the world's green tea and supplied 82 percent of the world's trade in green tea, but only 8 percent of the black tea trade (see Table 1). In 1986 China exported 92,000 tons of black tea worth U.S.$144 million, 58,200 tons of green tea worth $126 million, and 20,700 tons of specialty tea worth $56 million. These figures give unit values of US$1.57, 2.16, and 2.71 per kilogram for black, green, and specialty teas, respectively. Its total exports were 24.4 percent up in volume and 12.8 percent in value for 1985 (Ministry of Commerce, 1987b, p. 297; but see different figures in China's *Foreign Economic and Trade Yearbook*, 1987, p. 341). Its most valued customers in 1986 were Poland, Morocco, Hong Kong, the Soviet Union, Japan, France, Tunisia, the United States, and the United Kingdom in that order (China, *Foreign Trade Yearbook*, 1987, pp. 432–35). Tea exported to Poland and the Soviet Union is mainly traditional Chinese black, known as *congu* (gongfu), roasted green to Morocco, Tunisia, France, and steamed green to Japan, broken black to the United States and the United Kingdom, and a variety of teas to Hong Kong. See Chart 2 and Appendix Table 3.

Both India and China have enormous domestic markets and only export about one-third of their total production. In India, increasing domestic demand, which is elastic to income, has brought great economic and political pressure to bear on the government to reduce exports. China also faces the dilemma of measuring the cost of diverting tea away from a domestic market where demand is high and unsatisfied. The tea war of 1987 wit-

Chart 2.—China Tea Exports by Type, 1950–87



Sources: China, 1985, *China Agricultural Yearbook* (in Chinese), China Agricultural Publishing House, Beijing, p. 80; China, 1986, *China Statistical Yearbook*, State Statistical Branch, Beijing and Hong Kong; China, 1987, *Statistical Yearbook of China* (in Chinese), State Statistical Publishers, Beijing and Hong Kong; *Beijing Review*, 7–13 March 1988, p. II; China, *China Yearbook of Foreign Economic Relations and Trade, 1984* (in Chinese), Hong Kong, pp. 916,; 1985, p. 846; 1986, p. 983; 1987, p. 341.

nessed a mad scramble for fresh leaf and crude tea by buyers who bid up the price and caused a shortfall in supplies that supposedly were guaranteed for the export market. Export prices, even with a concessional foreign exchange rate, could not match those offered by the domestic market. This phenomenon will be difficult to control with the freeing up of tea marketing that has occurred since 1984.

The accuracy of world tea price forecasts hinges critically on the relative rates of production growth and domestic demand in these two countries. The next level of producing-exporting countries—Sri Lanka, Kenya, Indonesia, and Bangladesh—are much more reliant on the international market to absorb any increases in production. While 99 percent of tea produced in India is black tea, over 80 percent of China's tea production is green tea. China exports only 20 percent of its green tea, but over 90 percent of its black tea production, which has been increasing at over 7 percent per annum over the last 15 years. For this reason the World Bank concludes that, "A major uncertainty in future world [black] tea output projections is the prospect of China's black tea production" (World Bank, 1986, p. 55).

If China's production and exports of black tea continue to grow at the rate they have in the recent past, the World Bank predicts that world tea prices are likely to be 10 percent lower than they would otherwise be by the turn of the century. In 1986 production of black tea rose by a mammoth 42.7 percent over the previous year, whereas output of green increased by a more modest 7.8 percent (Ministry of Commerce, 1987b, p. 297). For exports the increases were 56.5 percent for black while they remained constant for green tea. In 1987, exports of black tea fell back, but green tea increased by 15 percent. Considering that very little black tea is consumed in China, the driving force behind this rapid increase in output is clearly coming from the international market and China's desire to earn hard currency. For the trends in China's exports of black and green tea since 1950, see Appendix Table 3.

It becomes a serious matter, then, whether China continues to push black tea exports in the face of the downward trend in world prices or whether China seeks to develop further the exports of its own unique green teas. Reports from Chinese publications on this crucial issue are contradictory and confusing, even misleading and inaccurate. The current export policy seems to favor the promotion of black tea—with some factories switching processing from green to black tea. The Ministry of Commerce, in its 1986 yearbook, criticized the decision in 1984 of traditional green-growing districts to switch to the production of broken black for the export market, in the face of the sluggish domestic market of the previous two years (Ministry of Commerce, 1986b, p. 225). Quality was poor, returns low, and the teas were uncompetitive internationally. Because of the

volatility of the international market, the Ministry warned that producers switching in this fashion could be caught out in a downturn (p. 225). In Zhejiang Province, in order to solve the problem of low prices for summer and autumn teas, there have been moves starting in 1985 to process this tea as "broken black." The sales price is on average 50–60 yuan higher per 100 kg than if the same leaves were processed as crude green tea. In 1985 and 1986, exports of broken black from Zhejiang earned the industry $200,000 (Lu, 1987, p. 7). On the other hand, there is a real awareness that China produces many teas that other countries cannot easily copy.

A survey article of 1986 in an official Ministry of Commerce publication predicted a bright future for China's green teas on the world (Ministry of Commerce, 1986b, p. 224). In 1985 supplies, particularly of high grade *mei* (long-leaf roasted green) and special grade Gunpowder (round-leaf roasted), had not kept pace with demand. International trade had only been growing at an average annual rate of 5–6 percent, below the surge in demand. With the fall in exports from Taiwan and the failure of both India and Sri Lanka to produce green tea of a quality to match China's, the field was open for China to consolidate its already strong position. The problems remained those of quality and adherence to specified standards.

Both these points are covered by Chinese expert Xuelan Zuelan (1987). In tracing the evolution of the world tea market, she notes the historical switch of the North American market away from green tea. Her paper indirectly raises the question as to why the Americans made the change—was it simply a change of taste or was it linked to the relative prices and availability of the competing teas? The more probable explanation, not referred to by Zhuang, is that British control of the world tea market led to the British promoting the sale of tea from its colonies India and Ceylon in places like the United States, and that Chinese exporters were unable to meet strict controls of the U.S. Congress on the quality of foodstuffs entering the country. Zhuang notes the recent surge in American demand for herbal and scented teas. This raises a very significant question as to the potential for the promotion of some of China's own unique teas. To develop the overseas markets for these will take a concerted effort, backed by careful planning.

Recent import statistics from the United States reveal, however, that black tea imports continue to outstrip green by a ratio of nearly 16 to 1. In the first quarter of 1988, China was the third largest supplier of black tea to the United States behind Argentina and Indonesia, supplying about 15 percent of American imports. China supplies about 80 percent of America's imports of green tea (less than half of its exports of black tea to the United States) (*Tea & Coffee Trade Journal*, 1988, p. 47).

China currently sells a little tea through international auction markets. About two-thirds of exports are in direct commercial cash sales, and the

rest through government contracts and through barter arrangements with Eastern Europe (especially the Soviet Union and Poland) and state-run economies (Iraq, Tunisia, Algeria, Libya, and Yemen). While black tea exports go primarily to Europe, North America, and Oceania, China's green tea and specialist teas (like Jasmine, Puer(h), steam, compressed, 3505, Gunpowder, and Sumi) are mainly sold by counter trade or cash contract to overseas Chinese markets in Japan, North and West Africa and, because of its sizable North African population, France. The global distribution of China's tea exports is shown in Table 6. Morocco is the unlikely candidate for China's largest export market.

Tea was China's most valuable agricultural export commodity in 1984 and 1985. In 1986, it was second to aquatic products, and in 1987 to silk. In 1986, the total value of China's exports were about $30 billion; of this primary commodity exports other than fuels, minerals, and metals amounted to about $5.5 billion. Thus, tea exports of $327 million were about 5 percent of primary product exports and only 1 percent of total exports. Exports continued to grow from 137,000 tons in 1985 to 195,000 tons in 1988 (*Tea News*, April 30, 1989). Recent estimates from China suggest that tea exports will earn the country $428 million in 1988, well above the target of $308 million and the 1987 earnings of $326 million.

For the seventh Five-Year Plan (1986–90), the central government has set an export target of an annual percentage increase of 12.6 percent. Thus, by 1990 tea allocated for export should have reached 250,000 tons (allowing 20 percent wastage in transport, turnover, storage, and blending) (Shen and Wang, 1987, p. 9).

China has also introduced reform policies in its foreign trade system since the late 1970s in an attempt to give the provinces more autonomy in conducting international trade. The central authorities permit provincial-level trading companies and provincial branches of national foreign trading corporations to buy and sell goods from local producers and for local governments to retain a portion of foreign currencies. These are called "self-managed exports." According to one report, the export of tea remains under the control of the national office of the China Native Produce and Animal Byproducts Import-Export Corporation (Ross, 1988, p. 34). However, Anhui Province reports that for 1986 $15.6 million of its $21.9 million in tea exports came from the self-managed sector. Due to exchange costs on the U.S. dollar exceeding state standards, losses on exports totalled 14.12 million yuan. The principal reason given was that procurement prices in that year shot up by an average of 44 percent leading to losses in the processing sector totalling 22 million yuan (Anhui, 1987, p. 203).

Table 6.—Chinese Exports of Tea and Countries of Destination*
(*Tons*)

Country	1985	1986	1987
Green tea			
France	4,641	4,280	3,470
Soviet Union	6,153	43,025	7,834
United States	5,253	4,307	5,263
Afghanistan	1,721	3,236	2,626
Hong Kong	2,301	3,987	4,503
Japan	2,176	2,018	1,872
Macau	2,095		
Pakistan	1,843	3,196	2,462
Algeria	2,135	5,042	2,191
Cameroon	2,912		
Libya	2,800		
Mauritania	2,454		4,250
Morocco	17,030	18,039	22,685
Niger		1,318	
Senegal		1,297	1,054
Togo			1,648
Tunisia	2,000	2,200	1,600
Total green tea	60,659	61,054	69,540
Black tea			
United Kingdom	9,240	11,016	8,732
West Germany	2,864	3,171	2,780
Netherlands	1,738	2,314	2,264
Poland	9,814	16,167	12,002
Soviet Union	3,852	9,032	10,467
United States	6,529	12,764	11,276
Hong Kong			1,578
Iran	1,167		
Iraq		10,600	7,155
Pakistan	3,460	3,933	5,628
Yemen		1,015	1,332
Egypt	1,814	3,000	2,650
Libya			1,530
Sudan	2,206		
Tunisia	8,300	10,499	7,136
Australia	1,619	2,582	2,448
New Zealand	1,668	1,614	2,296
Total black tea	60,949	95,265	86,090

Table 6.—(*Continued*)

Country	1985	1986	1987
Other tea			
Hong Kong	7,061	7,153	8,107
Japan	5,673	5,578	6,062
Total other tea	15,256	15,709	18,644
Total all tea	136,864	172,028	174,274

Source: International Tea Committee, 1988, *Annual Bulletin of Statistics*, London, pp. 46–47.

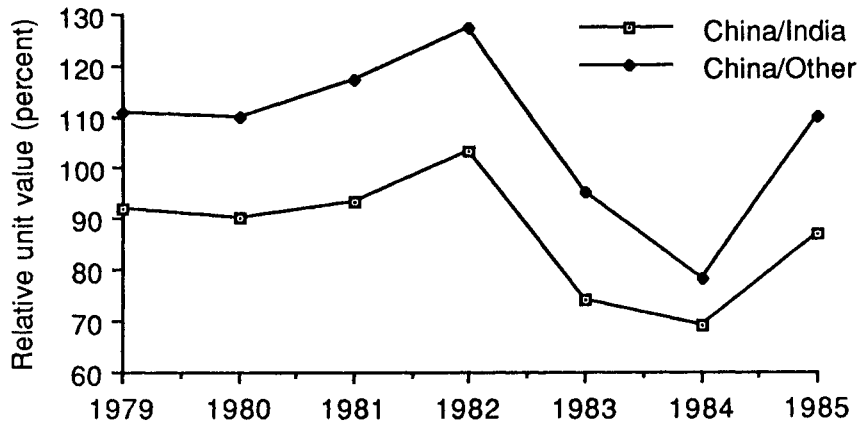
*Countries listed separately only if imported minimum of 1,000 tons.

Export Quality

It is difficult to gauge the quality of China's tea entering the world market. On the one hand, the 11 and 107 tons of China's black tea sold on the London auctions in 1985 and 1986, respectively, obtained the lowest average prices of any country selling through the auction market—indeed in both years the price was less than half the average of all teas sold there. On the other hand, the average unit values of China's tea exports measure up very favorably against the international average and are not far behind India's (see Chart 3). The dip in China's relative performance in 1984 suggests that its counter or barter trade continued at a constant unit value while prices increased substantially on commercial markets. A comparison of Chart 3 with Chart 4 shows the relative stability of the unit value of China's tea exports compared to world prices.[13] China suffered less in the

[13] There are two problems in gauging the real unit value of China's tea exports from the *FAO Trade Yearbook* (1985, 1986) from which Chart 3 is derived. First, the substantial counter trade, and second, because Taiwan's exports are included in the FAO figures for China. However, the latter problem is likely to be minor as Taiwan's volume of tea exports is well under 10 percent of the Chinese total. Furthermore, China's own Customs Department statistics confirm the general quality issue (as measured by the unit value) depicted here. Whereas the average price of black tea sold on the London auction was U.S. 198 cents/kg in 1985, Chinese statistics show an average unit export value (presumably fob) of 215 cents/kg, a 2 cent rise from the previous year (China, 1986a, p. 487). The explanation for the difference between the price received for the Chinese tea sold on the London auction and the average unit values lies in the quality differences of China's green, black, and other teas exports. Figures earlier for 1986 exports imply unit values of 216, 157, and 271 cents/kg, respectively, for these broad categories of tea.

Chart 3.—Relative Unit Value of China's Tea Exports, 1979–85*



Sources: Calculated from Food and Agriculture Organization, 1985, 1986, *FAO Trade Yearbook*, Rome.

lean years of 1981 and 1982, and gained less in 1983 and 1984. Since the peak prices of 1984, world prices have continued to decline.

In 1986 the state invested $6.74 million under a plan to construct an export production system. $4.13 million has been earmarked for black tea, and $1.23 for green tea, with the remaining $4.13 million unspecified. The funds have been distributed half as allocations converted into loans and half as bank loans. The money will be used in the production, processing, extension, storage, and marketing of the industry, specifically for the construction of export bases, renovation of old fields, and expansion of fine bush strains, modernization, and expansion of processing plants (Ministry of Commerce, 1987b, pp. 305–06).

PROBLEMS AND PROSPECTS

The more rapid rates of increase in production in 1980–82 and since 1985 appear to be responses to the massive planting in the 1970s and to production and marketing reforms. However, a number of problems still remain:

1.) The very small holdings discourage tea field rehabilitation, the spread of improved bush varieties, and plant protection measures if extension services lack mechanisms for communicating to farmers. In 1985 and 1986, the number of pests in the tea fields increased due to the lack of facilities to deal with them (Ministry of Commerce, 1987b, p. 304). Small and dispersed tea fields are hard to manage, and there is a reluctance to use limited funds to invest in field improvements.

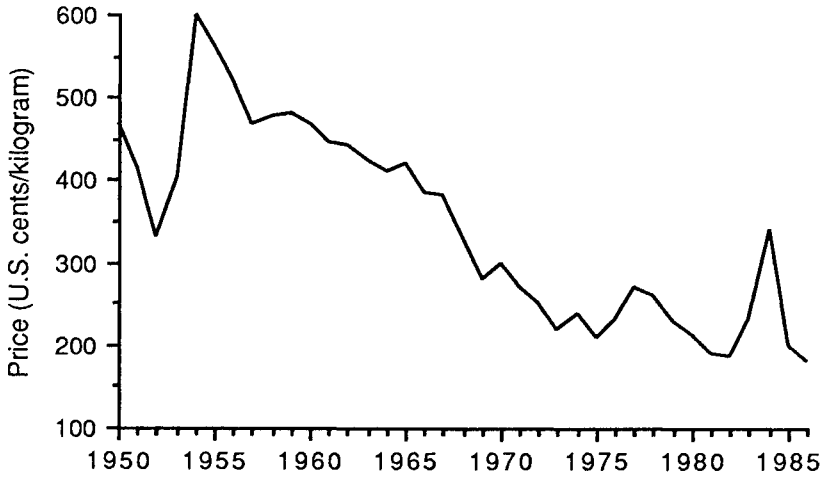
2.) Small farmers are reluctant to invest in improved cultivation techniques when most contracts are only for about four years, less time than it takes for a tea bush to mature. One article examining the causes for a downturn in tea output in a district of Hunan Province argued that contracts should be no shorter than fifteen years. Complaints of unreasonable terms in the contracts and inequitable distribution of profits are also heard (*Tea News*, 1988). It is claimed that in Zhejiang Province, 80 percent of gross income goes to cultivation and tendering costs, plucking, processing, taxes, and contractual obligations, leaving a net return of 12–18 percent (Zhejiang, 1986, pp. 136–37). This results in short-run, profit-maximizing decisions that can be to the detriment of long-term bush maintenance. For example, there is the tendency for some tea processors to make rapid switches from one tea variety to another in response to price changes on the international market. In 1984, Chinese processors were enticed to produce black tea, and in 1985, Wulong tea became popular, causing some traditional green producers to shift processing techniques and equipment. Neither the skill nor the equipment can be adapted over such short periods without a drop in quality. One informed observer contends that this continual swing from one variety to another, resulting in periodic shortages or overproduction, has characterized the industry since 1949 (Zhang, 1987, p. 1)

3.) There was a relatively slow rise in yields on mature fields from a national average of 460 kg/ha in 1980 to 576.01 in 1986. However, the leading producer, Zhejiang Province, has experienced a substantial change in yields from 698 kg/ha in 1981 to 618 kg/ha in 1985 and back to 694 kg/ha in 1986. In Anhui Province, yields have fallen from a post-1949 peak of 661 kg/ha in 1976 to 455 kg/ha in 1985. By stark contrast, reported yields in the second largest producing province of Hunan have increased sharply from 593 kg/ha in 1981 to 753 kg/ha in 1985, and 761 kg/ha in 1986. And in the southern province of Guangdong reported yields have leaped from 454 kg/ha in 1980 to 717 kg/ha in 1986.

4.) China also faces the problem of deciding whether yield improvements gained through more intensive farming and the application of additional labor, which is in increasingly short supply, are economic. More extension of cultivation and opening up of new lands on mountain slopes may be the most efficient way to increase output. Large increases in prices of fertilizers, pesticides, fuel, and machinery, and other means of produc-

tion, as well as administrative charges make more intensive cultivation increasingly difficult. In Zhejiang Province, increases in fertilizer costs have reduced application of organic base fertilizers in one tea-producing county from 46 percent coverage in 1982 to only 4.6 percent in 1985 (Zhejiang, 1988, pp. 136–37). It is reported that supply and marketing cooperatives induce peasants to sign contracts by guaranteeing supplies of chemical fertilizers, first as a planned allocation, then as bonus and supplementary allocations for above-contract deliveries (Zhejiang, 1988, pp. 75, 93). Various enterprise taxes account for 35 percent of processing value, and if various other charges are added it amounts to 50 percent of value (Ministry of Commerce, 1987b, p. 304).

Chart 4.—World Tea Prices for 1950–86
(Constant 1985 prices)



Sources: World Bank, 1986, *Price Prospects for Major Primary Commodities*, Washington, D.C.

5.) Finally, in some of the eastern seaboard provinces there already exists a shortage of skilled pluckers to perform this painstaking and laborious task. These problems could lead to poor standards of plucking, lower yields, processing problems, and quality decline. Possibly in anticipation of this trend, China has developed hand-held plucking machines. (The introduction of mechanized plucking may in turn require allocation of larger tea fields.)

Tea research has not only contributed to developing high yield varieties that have resulted in some excellent yields but has also been significant in

the development of processing technologies, new products, and methods for the biological control of pests. An example is the development of a means of recovering edible oil from tea seed. Seed production seems to be the normal outcome of the field practices used in many parts of China. The economic implications could be important to the industry because the resultant oil becomes a direct substitute for olive oil. China in 1981 produced 654,000 tons of tea oil seed. By 1986 this figure had fallen to 438,000 tons. This amount of seed should produce 92,000 tons of oil. TRI's own estimate of the potential is more conservative, placing tea oil seed production at 125,000 tons with a potential of producing nearly 19,000 tons of oil (Xia et al., 1986, p. 20). However, figures from the principal tea oil-producing province, Hunan, state that in 1979 the province produced 57,800 tons of the oil (Hunan Provincial Statistics Bureau, 1984, p. 79).[14] These contrasting figures could be confusing refined edible oil and total tea seed oil production.

Tea research is the responsibility of the national Tea Research Institute in Hangzhou (capital of Zhejiang Province). This is one of 36 institutes of the Chinese Academy of Agricultural Sciences and, apart from its national responsibilities as the major reference laboratory, collaborates with and encourages the research of 15 provincial tea research centers. The role of TRI and the centers is crucial in terms of new developments, but it is not clear where responsibility lies for extension work to farmers under the household responsibility system. This linkage is likely to be vital if the tea industry in China is to continue its resurgence.

In 1983 Anhui Province, the country's third leading producer, had 643 technical cadres of whom 293 had secondary education and above (Anhui, 1984, p. 207). This represents about one technician per 150 ha of tea. But the provincial authorities say that there is an urgent need to train more extension personnel to give advice on field management, planting patterns, and fertilizer application, and to acquire extra staff for plant propagation units for improved varieties.

SUMMARY

This paper has reviewed the remarkable resurgence in China's tea industry since the mid-1960s. Although tea yields have increased rapidly, they are still low by historical or international standards and indicate enormous scope for further improvement. This suggests that careful analysis is needed to determine the precise causes for past increases. Comparative analyses are also needed of the technology used on higher yielding farms in the many different producing regions and for the different varieties.

[14] TRI has also developed a bottled black tea, and Anhui Province has produced such specialist teas as throat soothers and summer coolers.

The paper notes the complete transformation in tea-refining technology over the last 25 years. The relationship of this change in technology to the potential for improvements in the quality of tea needs exploring.

A simple demand projection suggests that the domestic market could absorb large increases in production at current prices. The Chinese are also aware that they need to improve their sales performance for domestic customers. To the extent that supply fails initially to keep up with rising demand, the resultant increases in prices in the freer market situation bring their own remedy.

Perhaps more important than total supply of tea, however, may be its allocation between domestic and foreign consumers. A major consequence of the new economic order has been the rise in domestic prices in response to rising incomes in China. This may be all very well for tea growers but constitute a real hardship even for other farmers whose crops are not enjoying similar increases in prices, and above all for city dwellers with fixed incomes not adjusted for the constant changes in prices that are no longer determined by administrative fiat.

According to the speculative and provocative paper by Shen and Wang (1987), by 1990 China will require an output of 700,000 tons (450,000 tons for domestic market and 250,000 for exports), a figure very difficult to obtain considering the 1987 total of 497,000 tons. In the face of the expected shortfall of 150,000 tons (based on a forward estimate of 550,000 tons for 1990), Shen and Wang suggest that the authorities face two options, one they describe as passive and the other active. Passive measures include reduction of exports, which in turn will reduce foreign earnings and result in the loss of markets to competitors, or restriction of domestic sales by a return to planned supplies. (India has had already to restrict exports due to the pressures, both political and economic, from the domestic market. See Xie, 1987, p. 17–18.) These measures, in the opinion of Shen and Wang, will only provide temporary relief to the problem. Active measures, on the other hand, include the expansion of plantation area, particularly in Yunnan, Guangxi, and Guangdong Provinces, and the establishment of export bases of large-leaf variety for the production of broken black tea. The second measure they suggest is renovation of low-yielding fields and stimuli to production such as increases in procurement prices and improvement in the contract system. Finally, Shen and Wang raise the possibility of growing tea in new areas of the country (1987, p. 9).

There is little doubt that in spite of a remarkable resurgence in recent decades, the tea industry in China is faced with enormous challenges in both the domestic and export markets if this expansion is to continue. For the first 30 years of the People's Republic, growing, processing, buying, and selling tea were a lucrative business compared to other agricultural crops. Profits were high in a situation where demand constantly outstripped

supply (Zhang, 1987, pp. 2–3). In 1982 and 1983, the industry faltered as peasants neglected their tea fields in the face of sluggish sales. Since the introduction of marketing reforms in 1985, tea has once again become a desirable crop to grow and process.

For the Chinese, the tea industry has long held a special place in the country's culure, social life, and economy. In the nineteenth century it occupied a place of pride as the country's leading export item as Europeans savored a drink that the Chinese had consumed for centuries. The collapse of the tea industry accompanied China's fall from preeminence.

The struggle to reinsitate the industry, both domestically and internationally, has been a lengthy and persistent one. In 1976, China overtook Sri Lanka as the second largest world producer of tea. In 1982, national output surpassed the previous peak recorded in 1914. And in 1984, exports beat their previous record established in 1886! Although average yields are only 50 percent of those of 1914, and average domestic consumption lags well behind the levels of other major producing countries, the capacity of the Chinese to increase these figures and catch up with the rest of the world should not be underestimated.

Recent publications on the subject suggest that China will not rest until it has overtaken India to regain what China considers to be its rightful place as the world's leading producer of tea. National sentiment and pride demand and expect such an outcome.

There have been impressive and consistent increases in China's tea production over of more than two decades—decades that have seen major policy changes. The very impressive increases in production in the early 1970s and early 1980s continued a process of recovery from the deprivations of war and revolution. After the burst of increased output that followed the managerial reforms of 1978, the rate of growth slumped dramatically in 1983 to the lowest level since the disasters of the early 1960s. The reasons for this slowdown seem to have been particularly in the pricing and marketing policies for the crop. The recovery for the growth rate in the last three years appears to have been the result of the marketing reforms introduced in 1984. It is unclear how long the high rates of increase can continue. Low current yield levels suggest that there is still plenty of room for improvement, but this may be severely constrained by some of the problems that the industry continues to face. These include a tea-processing sector made up of many very small units that may mean it will be difficult to improve quality and handle increased output. On the production side, the industry has many thousands of farmers operating very small tea gardens who face increasingly high input costs and labor shortages. Recent reforms on the exchange and sale of land leases (Dowdle, 1988; Morgan, 1988) may enable the tea industry of China to continue its remarkable resurgence.

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APPENDIX—TEA: SOME BASICS

In general but not always, black tea is made from the leaves of *C. senensis var assamica*, and green tea from *C. senensis var sinensis*. The former tends to be a larger bush with relatively broad leaves while the latter is better suited to harsh climates. In their natural state, both varieties will grow into trees of 10 meters or more in height. When cultivated, tea seedlings or cuttings are planted out in the field after about one year in a nursery. Plant density varies enormously (from less than 5,000 to 240,000 plants per hectare) according to cultural practices, variety, and location. The young plants are pruned back to keep the top of the bush to about 1–1.5 meters. Typically, bushes are first harvested or "plucked" of their fresh young leaves when they are two to three years of age. The raw product, consisting of a growing bud and up to three leaves, is referred to as "green leaf." Commercial yields are achieved after six years and fully mature yields from year ten onwards. The bushes, if correctly maintained, will be productive for 50 to 100 years. A key factor in maintenance is the regular pruning back of the bushes every four to five years to ensure that the bushes do not get too high and to rejuvenate them with young shoots.

Plucking regimes vary greatly between varieties and locations. The more temperate the climate, the longer and more even the plucking season. At the one extreme, in tropical highlands, tea will be plucked all the year round with any one bush being plucked every week to ten days (Etherington, 1973). At the other extreme, in the main tea-producing province of China, Zhejiang, 50 percent of annual output is plucked in the spring "flush" of three weeks. The remaining output is harvested through summer and autumn. No tea is produced in winter (Etherington, 1989).

Fresh green leaf should be processed within four hours of plucking. The origin of the Chinese practice of roasting green leaf in the homestead to produce crude green tea is probably related to the difficulty of transporting the fresh leaf to a centralized processing point.

In China tea is classified by shape of leaf: round, known either as pearl

or eye; long, described as eyebrow or oval. It also may be classified by its method of manufacture (roasted, steamed, scented, or compressed) and extent of fermentation, by the time of plucking (spring, summer, or autumn), the region of production, scale of production (state farm, agricultural collective, or smallholder), final market (domestic or foreign, barter or cash), and color, aroma, and taste. The connoisseur has ample scope to judge varieties and quality.

China produces six main varieties, all with their own types of processing. The Chinese name their tea after the color of the infusion rather than that of the processed leaf: green, yellow, black, white, gray, and red. Green tea goes through fixation (halting fermentation by steam or roasting), kneading and twisting, and drying by wok, curing, or sun-drying. Yellow tea is processed in a similar way but with an additional drawing stage after drying that brings out the color. Dark green or black tea follows the first two stages of green, after which a stage called stacking and moistening is added to induce fermentation before drying. White tea progresses through two stages of withering and drying, while gray or Wulong tea, the most complex and difficult of all teas to process, proceeds through five stages of withering, semi-fermentation, roasting, kneading and twisting, and finally drying. Black or red tea processing is divided into four stages of withering, kneading and twisting, fermentation, and drying (Zhang, n.d., pp. 3–8).

All these are known as unrefined, crude, or bulk teas and are subject to grading, blending, and packaging before final sale. In addition, China produces scented and compressed teas that are made from either crude or graded teas. For scented teas, fragrant flowers are added to the semi-finished product that retains the characteristics of the base tea, whether it be green or black. Compressed teas, which are shipped to minority nationalities such as the Mongolians, Tibetans, and Turkic Moslems living in the remote areas of the country, are black (dark green) or red (black) teas (Tunxi Tea Industry School, 1980, pp. 4–6; Ministry of Commerce, 1986b, pp. 300–08).

The purpose of processing tea is to retain, impart, or create certain taste or flavor characteristics in the leaf and preserve it in a form suitable for transport and storage. The extent to which special care has to be taken in the packaging and storage of made tea depends on the variety and the humidity of the environment in which it is stored.[1]

[1] For general background on tea, see Eden (1965) or Harler (1966).

Appendix Table 1.—Provincial Tea Statistics for China, 1979, 1984, and 1987

Province	1979 Output (000 t)	1979 Area (000 ha)	1979 Yield (kg/ha)	1984 Output (000 t)	1984 Area (000 ha)	1984 Yield (kg/ha)	1987 Output (000 t)	1987 Area (000 ha)	1987 Yield (kg/ha)
National	277.15	1,050.33	263.87	414.13	1,077.40	384.38	509.71	1,044.07	486.53
Jiangsu	4.75	10.80	439.81	7.85	14.87	528.03	12.30	13.40	917.60
Zhejiang	65.45	164.60	397.63	95.55	178.40	535.59	115.88	170.60	679.20
Anhui	29.95	96.20	311.33	43.05	120.93	355.98	51.47	116.27	442.70
Fujian	22.80	99.73	228.61	35.25	126.40	278.88	49.93	122.53	407.50
Jiangxi	9.20	59.93	153.50	13.60	67.60	201.18	17.32	59.80	289.57
Shandong	1.05	5.40	194.44	.80	2.80	285.71	.75	1.73	431.04
Henan	1.15	12.87	89.38	1.80	17.20	104.65	2.40	14.53	164.80
Hubei	17.00	82.60	205.81	21.90	75.73	289.17	26.10	68.00	383.75
Hunan	57.35	167.47	342.46	74.80	124.00	603.23	79.12	106.40	743.60
Guangdong	10.55	42.00	251.19	20.00	46.33	431.65	28.65	49.13	583.10
Guangxi	7.05	27.07	260.47	9.45	23.67	399.30	13.70	21.87	626.00
Sichuan	28.35	115.60	245.24	49.00	111.80	438.28	54.38	110.93	490.24
Guizhou	6.25	39.47	158.36	10.10	30.53	330.79	12.99	27.33	475.35
Yunnan	14.85	98.33	151.02	28.15	109.93	256.06	39.18	133.53	293.44
Tibet	.00	.00	.00	.05	.13	375.00	.05	1.20	45.33
Shaanxi	1.35	28.20	47.87	2.70	26.60	101.50	3.66	26.33	138.99
Gansu	.05	.33	150.00	.09	.47	182.14	.09	.47	191.85

Source: Calculated from China, 1980, 1985, 1987, *China Agricultural Yearbook* (in Chinese), Beijing Agricultural Publishing House, Beijing.

Appendix Table 2.—Changes in China's Tea Statistics, 1979–87

Province	Output		Area		Yield	
	Annual rate of change		Annual rate of change		Annual rate of change	
	1979–84	1984–87	1979–84	1984–87	1979–84	1984–87
National	8.03	7.70	−.51	−.09	7.52	7.79
Jiangsu	10.05	11.65	6.39	4.83	3.66	6.50
Zhejiang	7.57	6.06	1.61	1.31	5.96	4.69
Anhui	7.26	6.03	4.58	3.55	2.68	2.39
Fujian	8.71	10.07	4.74	3.45	3.98	6.40
Jiangxi	7.82	7.63	2.41	1.05	5.41	6.51
Shandong	−5.44	−6.53	−13.14	−12.64	7.70	6.99
Henan	8.96	7.75	5.81	3.63	3.16	3.98
Hubei	5.07	4.98	−1.74	−2.78	6.80	7.98
Hunan	5.31	5.19	−6.01	−6.08	11.32	12.00
Guangdong	12.79	13.58	1.96	1.53	10.83	11.87
Guangxi	5.86	5.91	−2.68	−4.40	8.54	10.78
Sichuan	10.94	10.82	−0.67	−1.00	11.61	11.93
Guizhou	9.60	9.20	−5.13	−5.34	14.73	15.36
Yunnan	12.79	13.11	2.23	2.51	10.56	10.34
Tibet[a]						
Shaanxi	13.86	12.93	−1.17	−1.22	15.03	14.32
Gansu	10.61	9.25	38.92	38.31	−28.31	[b]

Source: Calculated from China, 1980, 1985, 1987, *China Agricultural Yearbook* (in Chinese), Beijing Agricultural Publishing Company, Beijing.

[a]Not available.

[b]Not significant.

Appendix Table 3.—China's Exports by Type, 1950–88
(*Thousand tons*)

Year	Black tea	Green tea	Other[a]	Total
1950	3	5	11	19
1951	11	5	11	27
1952	16	8	5	29
1953	10	10	1	22
1954	9	16	2	26
1955	12	17	2	31
1956	16	22	3	41
1957	19	19	22	41
1958	24	21	3	47
1959	27	21	3	51
1960	21	18	4	43
1961	16	17	2	35
1962	15	14	2	30
1963	16	13	2	31
1964	14	16	2	32
1965	19	16	3	38
1966	17	15	3	35
1967	16	14	2	33
1968	18	16	3	37
1969	18	17	0	35
1970	20	14	3	41
1971	28	20	5	53
1972	21	22	5	48
1973	20	19	11	50
1974	29	23	12	64
1975	29	23	10	61
1976	29	19	13	61
1977	38	35	9	82
1978	36	45	6	87
1979	52	47	8	107
1980	49	49	10	108
1981	45	41	6	92
1982	52	45	9	106
1983	67	49	8	125
1984	75	60	11	145
1985	61	61	15	137
1986	95	61	16	172
1987	86	70	19	174
1988	100	74	23	197

Sources: China, 1983, *China Agricultural Yearbook* (in Chinese), Beijing Agricultural Publishing House, Beijing, p. 134; China, Government of, 1984, *Yearbook of China's Foreign Relations and Trade*, Hong Kong, p. 916; International Tea Committee, 1988, *Annual Bulletin of Statistics*, London, pp. 46–47; and *Tea News*, 30 April 1989.

[a]Principally Wulong, scented, and compressed.