The Problem of Food Supply in China, 1912-1927

Ts'ui-jung Liu*

This article was originally published in *Proceedings of the Conference on the Early History of the Republic of China, 1912-1927* (中華民國初期歷史研討會論文集，1912-1927) edited by the Institute of Modern History, Academia Sinica (April 1984), pp. 657-673.

This paper is attempted to review the problem of food supply during the early Republican period (1912-1927). That China was a "Land of Famine" drastically implied there was food shortage during the early twentieth century in this large agricultural country.[1] To what extent did this problem of food shortage exist during 1912-1927? This is the subject to be discussed in this paper. It should be first pointed out, however, there is no attempt to explore into achieves for new data to support argument of this paper. Rather, my effort is merely to clear up this problem of food shortage by using mostly familiar data. The discussions will first be focused on agricultural production from an overall point of view and then shift to the problem of circulation of agricultural products and food supply.

1. An Overall View of Agricultural Production

Two major factors of agricultural production are land and labor. As regards to the data of these two production factors, there is a lack of complete time series during the early Republican period. Due to this fact, scholars dealing with this topic often have to use available data of certain time point to make reasonable estimations for other time points. So far as we know, the most complete statistics for Chinese economy during the first half of the twentieth century are those for the year 1933 organized by Ta-chung Liu and Kung-chia Yeh.[2] Many scholars have thus adopted the data of 1933 as basic reference when discussing the economy of the early Republican period. Dwight Perkins in his *Agricultural Development in China* took exactly this method. He used the 1933 data of Liu and Yeh and with the help of the indexes issued by the National Agricultural Research Bureau (Chung-yang nung-yeh

* Research Fellow, the Institute of Economics, Academia Sinica.

1 Water H. Mallory, *China: Land of Famine* (New York, 1926).

2 Ta-chung Liu and Kung-chia Yeh, *The Economy of the Chinese Mainland: National Income and Economic Development, 1933-1959* (Princeton, 1965), p. 129, p. 178.

shih-yen-so 中央農業實驗所) to estimate the cultivated acreage and population in the early Republican period.[3] Table 1 shows the cultivated acreage and population estimated by Perkins.

Table 1: The Cultivated Acreage and Population, 1893-1933

Province	Cultivated Acreage (million *shih-mou*)			Population (millions)		
	1893	1913	1933	1893	1913	1933
Manchuria	32*	123*	206	5.4	20.1	35.3
Sinkiang	10*	12	16	(3.8)	(3.8)	2.7
Mongolia	-	-	-			1.1
Suiyuan	26	25	24	2.1	2.6	2.7
Chahar	19	20	19	1.6	2.0	2.2
Ningsia	3	3	3	1.6	1.1	1.0
Tsinghai	4	4	5*	1.3	1.3	1.3
Kansu	49	50	51*	6.4	7.2	6.5
Shensi	58	56	54	9.5	10.0	9.7
Shansi	53	56	56	10.9	11.6	12.4
Hopei	118	120	118	27.2	29.6	30.6
Shantung	125	127	120	37.5	38.4	40.3
Honan	106	125	123	36.3	38.4	36.3
Kiangsu	85	86	92	28.4	33.7	34.9
Anhwei	87	88	88*	17.7	21.2	24.0
Chekiang	44	31	33*	18.3	19.2	22.0
Hupei	53	55	65*	19.7	21.8	27.3
Hunan	58	59	58*	27.4	29.9	33.4
Kiangsi	47	44	43	17.7	17.7	16.5
Fukien	28	27	23	13.7	13.9	13.1
Kwangtung	58	58	58*	26.7	30.8	34.0
Kwangsi	37	41	43	11.0	15.0	16.6
Kweichow	20	21	22	10.4	-	12.6
Yunnan	12	15	36	9.0	12.0	15.9
Szechwan	108	110	116*	41.7	47.7	59.2+
Tibet	-	-	-	(1.4)	(1.4)	1.4
Special Municipalities	-	-	-	-	-	10.1
Total	1,240	1,356	1,471	386.7	430.4	503.1

Source: Dwight H. Perkins, *Agricultural Development in China, 1368-1968* (Chicago, 1969), p. 212, 236.

* See explanations in pp. 236-237 for these entries. + Including the population in Sikang, p. 213.

[3] The index of population computed by the National Agricultural Research Bureau can be seen in Bureau of Statistics, Executive Yuan, compiled, *Chung-hua-min-kuo t'ung-chi t'i-yao* 中華民國統計提要 (Statistical abstract of the Republic of China, Nanking, 1935; Taipei: reprint, 1972), p. 483. The index of cultivated acreage can be seen in Bureau of Statistics, ed., *Chung-kuo t'u-ti wen-t'i chih t'ung-chi fen-hsi* 中國土地問題之統計分析 (Statistical analysis on the land problem in China, 1941; Taipei, reprint, 1978), p. 44. These indexes are also collected in Chang Yu-i 章有義 ed., *Chung-kuo chin-tai nung-yeh-shi tzu-liao* (hereafter NYSTL) 中國近代農業史資料 (Historical materials on agriculture in modern China), (Beijing, 1957), Vol. 3, pp. 907-908.

In Table 1 the statistics for the years 1893, 1913, and 1933 are listed together in order to observe changes through a long-term perspective. It is quite clear that the cultivated acreage and population increased during the early Republican period. In 1913, the cultivated acreage in the country as a whole was 1,356 million *shih-mou* 市畝 (1 *shih-mou* = 0.1647 acre), compared with the 1,240 *shih-mou* in 1893, there was an increase of 9 percent over 20 years. The population was 430.4 million in 1913, compared with the 386.7 million in 1893, there was an increase of 11 percent over 20 years. From 1913 to 1933, the cultivated acreage increased 8 percent and the population increased 17 percent. In terms of annual increase rate, during 1913-1933, the cultivated acreage increased 0.4 percent while the population increased 0.8 percent. Moreover, in terms of per capita cultivated acreage, it was 3.21 *shih-mou* in 1893, decreased to 3.15 *shih-mou* in 1913 and again to 2.92 *shih-mou* in 1933. Thus it is obvious the cultivated acreage did not increase as fast as the population and the population pressure on land had become more and more serious during the early Republican period.

The cultivated acreage and the population referred above are the total numbers. If limited to cropping acreage, then the grain cropping acreage accounted for 80 percent of the total cultivated acreage.[4] The agricultural population (i.e., the population engaging in agriculture) was estimated as 73 percent of the total population by John Lossing Buck and accepted by other scholars.[5] Or roughly speaking, there were three-fourths of the total population engaging in agriculture.[6]

With the inputs of land and labor, the agricultural outputs are produced under certain level of agricultural technology implying the input of capital. The technology related to crop production includes farming implements, irrigation, fertilizing, improving seeds, and the methods of cultivation. As for the implements used by the Chinese farmers, it is generally regarded as lack of change since the Ming period (1368-1644).[7] During the early Republican period, adoption of new implements had become more popular in the countryside. For instance, the water pumps were widely used in Kiangsu province.[8] According to the statistics of Maritime Customs, during 1912-1927, the value of imported agricultural implements accounted for 4.5 million HK (Haikuan) taels annually on the average.[9]

As for the irrigated acreage, according to the estimates of Perkins, it has

---

[4] Dwight H. Perkins, *Agricultural Development in China*, p. 17.
[5] Liu and Yeh, *The Economy of the Chinese Mainland*, p. 36.
[6] R. H. Tawney, *Land and Labor in China* (London, 1932; Boston, 1966), p. 26.
[7] Dwight, H. Perkins, *Agricultural Development in China*, pp. 56-57.
[8] Chang Yu-i, ed., *NYSTL*, Vol. 3, pp. 873-875.
[9] Ministry of Industry (Shih-yeh-pu 實業部) ed., *Chung-kuo ching-chi nien-chien* 中國經濟年鑑 (Yearbook of Chinese Economy), (Shanghai, 1934), pp. (F)275-279. Also included in Chang Yu-i ed., *NYSTL*, Vol. 2, p. 410; Vol. 3, pp. 873-875.

increased before 1930 (during 1914-1919, there were 352 million *mou*; during 1924-1929, there were 395 million *mou*; 1 *mou* = 666.67 m^2). However, Perkins pointed out that the effect of irrigation on the increase of food crop output could not be exactly estimated.[10]

Some remarkable technological improvements can be seen in the adoption of new seeds and their extension. For example, the early ripening rice (Champa rice) and other improved rice seeds had been adopted widely since the eleventh century; the American food crops – sweet potato, maize, and peanut – were introduced and gradually extended since the late sixteenth century. The former made it possible to practice double-cropping system in a wider area and the latter made it possible to utilize marginal land.[11] In addition, there are various kinds of rotating cropping patterns that were developed by farmers through the accumulation of experiences over a long time.[12]

According to an estimate of Perkins, the result through using new seeds, improved seeds, and rotating cropping patterns had contributed to the increase of food production over six centuries before the mid-twentieth century; the amount was about 39 to 57 million tons.[13] As for the technological improvement during the early Republican period, two aspects should be noted here: (1) the experimental farms established in many provinces, and (2) the import of chemical fertilizer. From 1912 to 1931, there were altogether 552 experimental farms established in provinces. Some significant results had been achieved in the breeding of new seeds by using scientific methods.[14] The import of chemical fertilizer amounted to only 800,000 piculs in 1912; it increased to 2,500,000 piculs in 1928 and to 3,800,000 piculs in 1930. The chemical fertilizer was mostly distributed in provinces along the coast, particularly in Kwangtung, Chekiang, Kiangsu, and Hopei.[15]

How large then was the agricultural output during the early Republican period? Again, according to the estimates of Perkins, Table 2 shows the yield and output of major crops in normal years during 1914-1918 and 1931-1937.

---

[10] Dwight H. Perkins, *Agricultural Development in China*, pp. 64-65.

[11] Ping-ti Ho, "The Introduction of American Food Plants into China," *American Anthropologist*, Vol. 57, No. 2 (April 1955), pp. 191-201; "Early-Ripening Rice in Chinese History," *Economic History Review*, Vol. 9, No. 1 (December 1956), pp. 3200-218. Cf. Dwight, H. Perkins, *Agricultural Development in China*, pp. 37-53.

[12] For example, John Lossing Buck, *Chinese Farm Economy* (Shanghai, 1930), pp. 168-179, listed rotating cropping patterns at 17 localities.

[13] Dwight, H. Perkins, *Agricultural Development in China*, pp. 51-52.

[14] *Chung-kuo ching-chi nine-chien*, pp. (F)295-297. Of these 552 experimental farms, 295 were established during 1912-1928.

[15] *Chung-kuo ching-chi nine-chien*, pp. (F)261-262, listed the quantity and value of imported chemical fertilizer during 1924-1932; Chang Yu-i ed., *NYSTL*, Vol. 2, p. 410; Vol. 3, p. 878, listed the statistics from 1912 onwards; but the figures in these two sets of data are slightly different. In mainland China, a great amount of chemical fertilizer was used only after the mid-twentieth century, see Dwight H. Perkins, *Agricultural Development in China*, p. 74.

Table 2: Yield and Output in Normal Years

Unit: Yield in catties/*mou*; Output in million catties

Crops	1914-1918		1931-1937	
	Yield	Output	Yield	Output
Rice (unhusked)	--	147,610	342	139,110
Wheat	114	39,570	114	46,200
Corn	--	14,680	193	20,440
Potatoes*	--	7,060	--	15,280
Kaoliang	170	23,750	170	24.680
Millet	160	22,180	160	27,680
Barley	150	18,090	150	19,440
Other grain	--	10,370	--	10,940
Total grain output		283,300		319,960
Per capita grain output	675 catties		615 catties	
Soybean	--	10,970	162	16,860
Peanut	170	4,540	170	5,250
Rapeseed	65	3,800	65	5,080
Sesame	78	670	78	1,810
Cotton	23	1,606	23	1,888
Hemp fibers	150	1,410	150	1,350
Tobacco	150	1,590	150	1,830
Sugar cane	5,200	18,720	5,200	18,720
Tea	--	445	--	399
Silk cocoon	--	406	--	419

Source: Dwight H. Perkins, *Agricultural Development in China*, pp. 266-286.
* This item is calculated by converting 4 catties of potatoes to 1 catty of grain.

In Table 2, the crops are grouped into two categories: food crops and cash crops. The food crops include rice, wheat, maize (corn), potatoes, kaoliang (sorghum), millet, barley and miscellaneous grain. The cash crops include soybean, peanut, rapeseed, sesame, cotton, hemp fibers, tobacco, sugar cane, tea and silk cocoon. When every item is carefully compared, it can be seen that yield per *mou* had not been changed very much between the two periods. There were changes, however, in annual outputs. While the outputs of most crops increased, three items – rice, hemp fibers, and tea – decreased in 1931-1937.

The total output of food crops in 1931-1937 (319,960 million catties) was somewhat larger than those of 1914-1918 (283,300 million catties); the increase during 20 years was 13 percent (annual increase rate was 0.6 percent). The per capita output, however, decreased from 675 catties in 1914-1918 to 615 catties in 1931-1937; the decrease during 20 years was 9 percent. Although on the average, per capita output of food crops was still higher than the subsistence level (about 400 catties),[16] the fact of decrease was indeed a warning of food shortage.

[16] Dwight H. Perkins, *Agricultural Development in China*, pp. 6-7.

The outputs of various cash crops were closely related to the development of manufacturing industries using certain cash crops as raw materials. In elsewhere it had been shown that cotton industry, flour milling, oil pressing, and cigarette industry all developed considerably during the early Republican period.[17] Here, as shown in Table 2, the increasing output of cotton, wheat, oil bearing seeds, and tobacco affirmed the development of related manufacturing industries. Moreover, the lack of development in hemp fiber textile, modern sugar industry, and tea manufacturing were also related to the non-increase in these cash crops. The slight increase in silk cocoon output reflected the situation in which silk reeling technology had not been improved very much.

In addition to various crops, livestock was also important agricultural products. Domestic animals not only provided meat but were still widely used as draft animals. Besides that, the dung of animals was a source of natural fertilizer and thus the number of animals also related to the fertility of land. Listed in Table 3 are numbers of heads of livestock in normal years during 1914-1918 and 1931-1937. It can be seen that the population of livestock increased between the two periods.

Table 3: Number of Heads of Livestock

Unit: 1,000 heads

Livestock	1914-1918a	1931-1937b
Hogs	63,500	68,358 (70,200)
Sheep and Goats	26,400	48,100 (72,200)
Oxen and Water buffaloes	23,000	37,900 (40,100)
Horses	5,000	6,690 (8,400)
Mules and Donkeys	5,000	14,400 (13,100)

Source: Dwight H. Perkins, *Agricultural Development in China*, p. 287.

a: The figures are the average of the years 1914-1915 and 1917-1918, for details of original data see the source.

b: Numbers in parentheses are estimates of Liu and Yeh, for details see the source.

As for the prices of agricultural products, since the data of 1933 were the most complete, they were used by scholars for estimating prices in other years. Table 4 shows the prices of agricultural products in 1933 and the value of output computed for the period 1914-1918 and 1931-1937 using the quantities listed in Tables 2 and 3.

[17] For studies on these industries see, for example, Chao Kang 趙岡 and Ch'en Chung-i 陳鍾毅, *Chung-kuo mien-yeh-shih* 中國棉業史 (A history of cotton industry in China; Taipei, 1977); Sherman Cochran, *Big Business in China: Sino-foreign Rivalry in Cigarette Industry* (Cambridge, Mass., 1980); Liu Ts'ui-jung 劉翠溶, "Min-kuo ts'u-nien chih-tsao-yeh chih fa-chan 民國初年製造業之發展 (Development of manufacturing industries in China, 1912-1928)," *Academia Economic Papers*, Vol. 11, No. 1 (March 1983).

Table 4: Price and Value of Agricultural Output

Items	Price in 1933 (*yuan*/catty)	Value of output in normal years (million *yuan*)	
		1914-1918	1931-1937
Rice (unhusked)	0.035	5,166.4	4,869.6
Wheat	0.045	1,780.7	2,079.0
Corn	0.029	425.7	592.8
Potatoes	0.040	282.4	611.2
Kaoliang	0.028	665.0	691.0
Millet	0.036	798.5	996.5
Barley	0.038	687.4	738.7
Other grain	0.035	363.0	382.9
Total value of food crops		10,169.1(60%)	10,961.7(55%)
Soybean	0.039	427.8	657.5
Peanut	0.052	236.1	273.0
Rapeseed	0.059	224.2	716.3
Sesame	0.080	53.6	144.8
Cotton	0.031	497.9	585.3
Hemp fibers	0.202	284.8	272.7
Tobacco	0.170	270.3	311.1
Sugar cane	0.006	112.3	112.3
Tea	0.258	114.9	103.0
Silk cocoon	0.250	101.5	104.8
Total value of cash crops		2,323.4(14%)	3,280.8(16%)
	(*yuan*/head)		
Hogs	17.4	883.9	951.6
Sheep and Goats	3.5	37.0	67.3
Oxen and Water buffaloes	50.0	172.5	284.3
Horses	48.0	24.0	32.1
Mules and Donkeys	48.0	24.0	69.1
Total value of livestock		1,141.4(6%)	1,404.4(7%)
Value of other products		3,400.0(20%)	4,140.0(20%)
Grand Total		17,033.9(100%)	19,786.9(100%)

Source: Dwight H. Perkins, *Agricultural Development in China*, pp. 288-289; the value of other products, see p. 30. The prices in 1933 are taken from Ta-chung Liu and Kung-chia Yeh, *The Economy of the Chinese Mainland*, Appendix B, pp. 319-356.

In terms of total value, it amounted to 17,033.9 million *yuan* during 1914-1918 and 19,786.9 million *yuan* during 1931-1937, both estimated at the 1933 prices. There was an increase of 16 percent between the two periods.

If the agricultural products are divided into four categories: food crops, cash crops, livestock, and other products (including forestry and fishing), then, the following points are notable. (1) The value of food crops counted for 60 percent in the first period while it was only 55 percent in the second period. (2) The value of cash crops counted for 14 percent in the first period and it increased to 16 percent in the

second period. (3) The value of livestock counted for 6 percent in the first period and increased slightly to 7 percent in the second period. (4) Other agricultural products counted for about 20 percent without changing in the two periods. The share of food crops decreased while the share of cash crops slightly increased; this seemed to indicate that the commercialization in agriculture might have been intensified during the early Republican period.

When the value of agricultural output was calculated in terms of per capita, according to Perkins, in the 1910s it was about 36.1 to 48.4 *yuan* and in the 1930s about 38.1 to 39.4 *yuan*, all estimated at the 1933 prices.[18] There was an increase of 3 to 5 percent between the two periods. As mentioned before, the increase in value of total output was 16 percent. Hence, it is quite obvious that the per capita value increase was less than the total value increase because the population was increasing faster.

From the above discussion on the overall agricultural production, a summary can be made here. During the early Republican period the population pressure on land had become more serious. Although in normal years the agricultural production still provide enough food for the increasing population and some raw materials for the developing manufacturing industries, it is quite obvious that the increase in food production (an annual increase rate of 0.6 percent) was not as much as the increase in population (an annual increase rate of 0.8 percent). Moreover, the per capita food output had decreased. Thus, even if a general food shortage had not occurred, once there was a serious natural calamity the food supply problem would be felt immediately.[19]

2. The Circulation of Agricultural Goods and Food Supply

As mentioned above, three-fourths of population was engaging in agriculture. In other words, there was one-fourth of population engaging in non-agricultural activities and they required food supplied by agricultural sector. Moreover, the agricultural sector also produced raw materials for the manufacturing industries. In the agricultural sector itself, the farming households also purchased some food and other necessities from the market.[20] Thus an enquiry into the circulation of products between the agricultural and non-agricultural sectors during the early Republican period is needed to understand the economic condition in that time.

---

[18] Dwight H. Perkins, *Agricultural Development in China*, p. 30, Table II.8.

[19] For major natural calamities in 1917, 1920, 1922, 1924, 1928, and 1931, see, *Chung-kuo ching-chi nien-chien*, pp. (P)72-94.

[20] John Lossing Buck, *Chinese Farm Economy*, pp. 382-392; cf. Feng Ho-fa 馮和法 ed., *Chung-kuo nung-ts'un ching-chi tzu-liao* 中國農村經濟資料 (Materials on Chinese rural economy), (1933; Taipei, reprint, 1978), pp. 37-46.

According to the investigation by the Nanking University during 1921-1925 at 17 locations in 7 provinces, the percentage of agricultural products sold by the farming households at these localities ranged from 31 percent to 84 percent of the total outputs, and on the average, it was 53 percent. Among the various crops, the percentage sold ranged from 22 percent (kaoliang) to 99 percent (rapeseed) of the total output of each crop, and between these two extremes, there were 26 kinds of crops, including rice.[21]

As pointed out by Perkins, although the percentage of agricultural products marketed by farmers could not be precisely estimated, it counted for 30 to 40 percent on the average in the 1920s-1930s, and it might have reached 50 percent in the lower Yangtze area.[22] During the early Republican period, the railroad transportation had enlarged the extent of circulation of agricultural goods. For instance, statistics concerning the years of 1916, 1918, and 1920 showed that the distance of railroad transportation of agricultural goods per ton increased from 200 kilometer to 273 kilometer, and again to 319 kilometer.[23] When it was measured in terms of marketing area, Perkins estimated that before 1910 there was about 20 to 30 percent of agricultural products sold at the standard markets nearby villages, another 5 to 7 percent entered into the interregional trade and only 1 to 2 percent entered into the international trade. However, there was a considerable change in the early Republican period. During 1920s-1930s, the international market still received only about 3 percent of the total agricultural products, but those went to interregional trade increased to more than 10 percent.[24]

The effect of trade on the increase of agricultural production might be rather limited. As regards to the production of cash crops, however, trade stimulated specialization among farmers and specialization in turn might help to raise the productivity of both land and labor.[25]

Inasmuch as farmers had to sell part of their products and to purchase some food and industrial goods from the market, how then were the terms of trade? This can be investigated by the relative price, a comparison between the prices received and paid by the farmers. Listed in Table 5 are the price indexes of Wu-chin 武進 county in Kiangsu province, Nan-ch'ang 南昌 county in Kiangsi province, and those estimated by Buck. The data of Wu-chin and Nan-ch'ang are those of single locality and of special items of commodities, while Buck's estimations are the average of 36 counties in 15 provinces and are general indexes of many commodities.

---

[21] John Lossing Buck, *Chinese Farm Economy*, p, 199, p. 202.
[22] Dwight H. Perkins, *Agricultural Development in China*, p. 114.
[23] Chang Yu-i ed., *NYSTL*, vol. 2, p. 233.
[24] Dwight H. Perkins, *Agricultural Development in China*, p. 136.
[25] *Ibid*.

Table 5: The Indexes of Prices Received and Paid by Farmers (1926=100)

Year	Wu-chin, Kiangsu			Nan-ch'ang, Kiangsi			Buck's Estimations		
	Received	Paid		Received	Paid		Received	Paid	Terms of Trade
	White Rice	Salt	Kerosene	Early Rice	Salt	Kerosene	(1)	(2)	(1)/(2)
1912	51	62	62	26	35	11	55	65	0.85
1913	50	64	69	22	36	11	58	65	0.89
1914	43	67	78	24	35	11	59	64	0.92
1915	49	67	83	28	34	14	61	68	0.90
1916	47	71	68	28	34	19	65	71	0.92
1917	43	76	69	31	35	28	69	76	0.91
1918	42	78	76	36	37	33	69	79	0.87
1919	43	83	64	41	38	36	69	82	0.84
1920	58	81	67	48	43	44	80	85	0.94
1921	63	83	69	45	48	47	90	88	1.02
1922	75	83	62	52	52	53	92	91	1.01
1923	78	83	87	62	53	58	98	95	1.03
1924	71	86	90	78	52	69	97	101	0.96
1925	74	90	96	103	55	33	102	101	1.01
1926	100	100	100	100	100	100	100	100	1.00
1927	98	106	127	107	148	148	95	103	0.92
1928	--	--	--	--	--	--	106	109	0.97
1929	--	--	--	--	--	--	127	118	1.08
1930	--	--	--	--	--	--	125	126	0.99
1931	--	--	--	--	--	--	116	135	0.86

Source: The indexes of Wu-chin and Nan-ch'ang are taken from Chang Yu-i ed., *Chung-kuo chin-tai nung-yeh-shih tzu-liao*, Vol. 2, pp. 429-431. The index of Wu-chin was originally based on 1910-1914=100, here converted into 1926=100. Buck's estimations see, John Lossing Buck, *Land Utilization in China* (Statistical Volume), pp, 149-150, cited in Dwight H. Perkins, *Agricultural Development in China*, p. 363.

A common phenomenon reflected by these indexes was that the prices had been increasing since 1912. There were some differences among these time series. For example, the price index of white rice in Wu-chin was somehow falling during 1914-1919 and this decline was not seen in other series. Moreover, the price index of white rice in Wu-chin and the index of price received by farmers in Buck's series all fell in 1927 while the indexes in Nan-ch'ang did not show this fall.

Take Buck's series for a basis of discussion. From 1912 to 1926, the index of price received by farmers was increasing faster than the index of price paid by farmers; the former increased from 55 to 100 while the latter from 65 to 100. During this period, the terms of trade, from the standpoint of farmers, was in general close to one. It appeared to be changing from slightly less than one to slightly more than one, showing that the terms of trade was turning better. In 1929, the terms of trade reached the highest value since 1912. However, after 1929, the increase in the price received

was gradually less than that in the price paid. In 1931, the index of price received was only 116 while the index of price paid was 135 and the terms of trade was turning against farmers.[26] In short, these price indexes indicated that farmers buying and selling on the market were, in general, not being unfavorably treated during the early Republican period. However, due to the fact that the elasticity of demand for agricultural products is smaller than that of industrial goods, once the prices are falling, the price of agricultural products will be falling faster than other goods and the farmers will be hurt more. The situation in 1931 was just a reflection of this truth.

The circulation of agricultural products not only related to the livelihood of farmers but also related to the problem of food supply in the country as a whole. In a long-term perspective, the food production in China during the six centuries since the Ming period was capable to keep pace with the population growth as Perkins had pointed out.[27] From the eighteenth century onwards, the population had increased enormously and a great number of people were not able to afford rice and wheat for their daily food consumption and had to rely upon other coarse foods, such as sweet potato and maize, for their subsistence. The situation during the early Republican period can be seen from observations by some field investigators.

For example, Ch'iao Ch'i-ming 喬啟明 reported: "The peasants in north China are used to eat those cheapest grains. In P'ing-hsiang平鄉 (in Hopei), Hsin-cheng新鄭 (in Honan) and other places, wheat is sold right after it is harvested and not consumed by the peasants themselves. What the peasants eat are kaoliang and beans which are much cheaper."[28] Another reporter stated: "[T]he staple export of agricultural products in Yueh-chou岳州, Hunan, is rice. …The peasants seldom eat rice; rather, they mix up sweet potato and broad bean with rice for their daily meals. Rice is sold to merchants for cash."[29] Moreover, according to a statistics in 1931, it was estimated that among various grains consumed by Chinese people, rice counted for 27 percent, wheat 21 percent, and other grains 52 percent.[30] These examples all demonstrated that if food supply was self sufficient during the early Republican period, all sort of grains were counted and not just rice and wheat.

As a matter of fact, owing to the increasing import of rice, wheat, and flour since 1912, an impression of food shortage had been established in public opinion.

---

[26] Cf. Albert Feuerwerker, *Economic Trends in the Republic of China, 1912-1949* (Michigan, 1977), pp. 45-47. Feuerwerker has said that the terms of trade were favorable to farmers until 1931.

[27] Dwight H. Perkins, *Agricultural Development in China*, pp. 13-36.

[28] Feng Ho-fa ed., *Chung-kuo nung-tsun ching-chi tzu-liao*, p. 47; also collected in Chang Yu-i ed., *NYSTL*, vol. 2, p. 425.

[29] Chang Yu-i ed., *NYSTL*, vol. 2, p. 425.

[30] Committee of Rural Reconstruction ed., *Chung-kuo nung-yeh chih kai-chin* 中國農業之改進 (Improvement in Chinese Agriculture), collected in *Chung-kuo nung-chinng tzu-liao san-chung* 中國農經資料三種 (Three kinds of materials on Chinese agricultural economics, Taipei, 1971), pp. 47-48.

Table 6 lists the import and export values of various grains and flour.

Table 6: Import and Export of Grain and Flour

Unit: value in 1,000 HK Taels

Year	Import rice, wheat and flour		Export kaoliang, millet, wheat & flour	
	Value	% of Total value	Value	% of Total value
1912	24,381	5.2	7,100	1.9
1913	28,691	5.0	9,096	2.3
1914	31,239	5.5	6,078	1.7
1915	26,212	5.8	6,861	1.6
1916	35,095	6.8	3,920	0.8
1917	32,483	5.9	7,300	1.6
1918	22,777	4.1	14,829	3.1
1919	9,542	1.5	29,692	4.7
1920	7,725	1.0	52,366	9.7
1921	45,027	5.0	27,794	4.6
1922	99,673	10.5	15,679	2.4
1923	134,528	14.6	14,735	2.0
1924	110,627	10.9	17,804	2.3
1925	78,602	8.3	21,173	2.7
1926	131,522	11.7	24,033	2.8
1927	135,685	13.4	34,012	3.7
1928	99,842	8.3	30,628	3.1
1929	143,316	11.3	22,973	2.2
1930	164,420	12.6	27,046	3.0
1931	180,627	12.6	17,723	1.9

Source: The values of import and export are taken from Hsiao Liang-lin, *China's Foreign Trade Statistics* (Cambridge, Mass., 1974), pp. 23-24, 32-33, 83.

It can be seen that the total value of imported rice, wheat, and flour together accounted for about 5 percent of the total import values before 1922, except for in 1919-1920. However, from 1922 onwards, the percentage was usually more than 10 percent. In other words, the imported grain and flour had indeed increased. As for the export, the total value of kaoliang, millet, wheat and flour was usually no more than 3 percent of the total export value. During 1918-1921, particularly in 1919 and 1920, the percentage was somewhat higher because in those years the export of flour was especially large.

Look at each item individually, it is clear that kaoliang and millet had only been exported and not imported; wheat and flour were turning from being export-surplus to import-surplus only after 1922; and as for rice, it had only import-surplus. The import-surplus of rice was most serious in Kwangtung. The *Improvement of Chinese Agriculture* had the following statement: "From the viewpoint of the entire country, the shortage of rice counted for the most serious

among all grains. Among the areas where the shortage of rice was felt, Kwangtung was the foremost. In 1919, the import of rice was 1.8 million piculs and Kwangtung took 1.6 million piculs. In 1923, the imported rice was 2.2 million piculs and Kwangtung alone took 1.7 million piculs. Thus, it is clear that Kwangtung always took more than two-third of the imported rice. Once the problem of grain supply in Kwangtung can be solved, the problem of the whole country will be half solved."[31]

In short, the food shortage in the early Republican period was only a local phenomenon. However, since the population pressure had become more serious and the adoption of new technology had been very limited, the agricultural production had faced crisis in this period.[32] Once there occurred floods and droughts, the crisis of food shortage would appear to be unbearable. This was exactly the case in the early 1930s.[33]

3. Concluding Remark

From an overall viewpoint, during 1912-1927, the cultivated acreage was increasing by an annual rate of 0.4 percent, the food crop production was increasing by 0.6 percent, and the population was increasing by 0.8 percent. This crucial fact of deteriorated man-land ratio and the lag behind of food production to population growth was a fundamental condition causing the problem of food shortage. Although the circulation of agricultural products had been increasing in extent, local food shortage was still felt whenever natural calamities occurred. As the new agricultural technology had not been adopted widely to promote the output during the early Republican period, the problem of food shortage could only be partly solved by importation of food, particularly after 1922.

[31] *Chung-kuo nung-yeh chih kai-chin*, p. 23.

[32] Wang Yeh-chien 王業鍵, "Chin-tai Chung-kuo nung-yeh te ch'eng chang chi ch'i wei-chi 近代中國農業的成長及其危機 (Agricultural development and its crisis in Modern China," *Bulletin of the Inastitute of Modern History*, vol. 7, pp. 350-370.

[33] See Ch'iao Ch'i-ming 喬啟明 and Chiang Chieh 蔣傑, *Chung-kuo jen-k'ou yu shih-liang wen-t'i* 中國人口與食糧問題 (The problem of population and food in China; Shanghai, 1936).