

THE IMPACT OF GOVERNMENT POLICIES ON SOYBEAN PRODUCTION, TRADE AND PRICES IN ASIA AND PACIFIC COUNTRIES SUCH AS JAPAN, ROC, AND KOREA*

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1. Trends in Supply and Demand of Soybean in the Region.

The consumption of soybeans in the region has been increased very rapidly during the last decade, due to the increased number of consumers and their higher income level. In particular, recent changes in consumer's preference for vegetable protein and oil make the soybean one of the most popular diet items. When we look at soybean consumption by sectors, soybean consumption for oil production shares about 80% of total consumption in the region. Soybean consumption for this purpose has also shown high increase, in Japan about 33.4% per annum, during the last decade. In addition to this, the increased consumption of livestock products along with rising consumers' incomes has also brought about a rapid increase in soybean consumption, because the induced demand for soybeans has increased due to the increase in livestock production.

The consumption of soybeans in the ROC, Japan and Korea has increased from 4,315 thousand tons in 1970 to 6,237 thousand tons in 1980. When the decade is divided into two five year periods, there is an increase in the first period of only 9.4%, but in the second a much higher increase of 32.9%. This can probably be attributed to the increase of induced demand, due to increased livestock production in line with the changes in consumer preference towards quality foods. Consumption can thus be expected to accelerate in the future.

On the other hand, this can be well explained by the income elasticity of demand. A case study (NACF 1978) carried out in Korea revealed that the income elasticity of soybean demand, including induced demand, was estimated at 1.2851, while the value in relation to soybeans used for human consumption was estimated at 0.8418. This means that a 10% increase

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TABLE 1 DEMAND FOR SOYBEANS

Unit: 1,000 M/T

		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
ROC ¹⁾	Production	65	61	60	61	67	62	53	52	41	32	26	16
	Import	618	525	712	626	529	827	800	655	959	1,104	939	1,113
	Demand	683	586	772	687	596	889	853	707	1,000	1,136	965	1,129
Japan ²⁾	Production	122	122	—	—	133	126	110	111	180	192	174	210
	Import	3,244	3,212	3,396	3,635	3,244	3,334	3,554	3,602	4,260	4,132	4,401	—
	Demand	3,366	3,334	—	—	3,377	3,460	3,664	3,713	4,440	4,324	4,575	—
Korea ³⁾	Production	229	232	222	224	246	319	311	295	319	293	257	216
	Import	36	61	31	73	66	61	119	151	223	422	417	529
	Demand	266	281	261	298	291	372	418	437	538	675	733	727

Source: 1) *Agricultural Yearbook* (1982) ROC, and *Agricultural Trade Statistics of Taiwan*, ROC.2) and 3) *FAO Production Yearbook* and *Trade Yearbook* (1981).

TABLE 2 SOYBEAN CONSUMPTION ACCORDING TO SECTOR IN JAPAN

Unit: 1,000 M/T

Year	Total Consumption	For Oil Production	For Human Consumption	(For Brewing)	For Animal Feed
1975	3,366	2,620	716	(190)	30
76	3,461	2,701	730	(193)	30
77	3,653	2,878	745	(193)	30
78	4,090	3,297	753	(188)	40
79	4,253	3,401	777	(205)	55
80	4,324	3,453	786	(208)	55
81	4,375	3,495 (79.9%)	785 (17.9%)	(200)	55
	(30%)	(33.4%)	(9.6%)		(83.3%)

Source: *Agricultural Statistics Book*, Ministry of Agriculture, Forestry and Fishery of Japan, 1983.

TABLE 3 TRENDS IN HARVESTED AREA AND YIELD

Country	Harvested area (1000 ha)			Yield(kg/ha)			Production(1000 M/T)		
	1969-71	1980	1981	1969-71	1980	1981	1969-71	1980	1981
World total	29,289	51,831	50,229	1,487	1,561	1,751	43,552	80,896	87,957
Asian total	9,376	9,710	9,923	999	1,026	1,041	9,394	9,977	10,336
ROC	42	15	10	1,525	1,692	1,543	65	26	16
Japan	100	142	144	1,286	1,223	1,458	128	174	210
Korea	292	188	202	783	1,150	1,270	228	216	257

Source: *FAO Production Yearbook* (1981) & *Taiwan Agricultural Yearbook*, Taiwan Provincial Government, ROC (1982).

in per capita real income will result in a 12.851% increase in aggregate soybean demand, and a 8.41% increase in the direct consumption of soybeans as food.

However, soybean production in the region revealed a very slow increase during this period, of only 9.1%. Japan and Korea had a slow increase in soybean production, mainly due to increased yields, but the ROC experienced a rather sharp decrease in soybean production during the decade, from 65 thousand tons in 1970 to 26 thousand tons in 1980.

As a result, the increased consumption has been supported through increased imports.

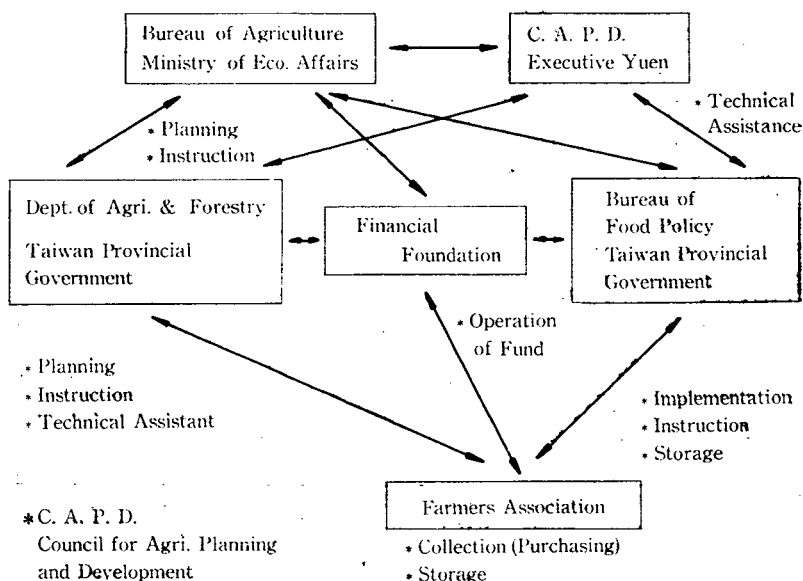
II. Impact of Government Policies on Prices, Production, and Trade

I. Policy patterns.

Although there are some differences in degree and pattern among the three countries in implementing price policy, all of them have, in general, adopted price support schemes for the encouragement of local soybean production.

The ROC has adopted the guaranteed price scheme since 1974 for

FIGURE 1 INVOLVED ORGANIZATIONS AND THEIR FUNCTIONS



soybean production. Under this scheme the ROC Government has purchased the whole amount of soybeans which farmers wish to sell every year and resold them to large consumers at import prices. The deficits which result from the differentials between the government guaranteed prices and the import prices are financed by the financial foundation which operates a grain fund which is accumulated with import duties from the imported grain.

In addition to this guaranteed price scheme, the ROC government also adopted rice crop transfer payment system which is a kind of direct subsidy payment scheme for the farmers who transfer their rice planting to soybean, corn and sorghum planting. Since it has recently faced a serious rice surplus production problem, the government adopted this transfer payment program in order to encourage the rice planting farmers to transfer their rice planting to other crops, i.e. soybean, corn and sorghum.

Japan has also been implementing price support policies for domestic soybean production since 1961 based on the law of grant-in-aid for soybean farms. Under this scheme the farmers who produce soybeans are guaranteed to sell their products at the standard price (A kind of government guaranteed price).

In addition to this government grant-in-aid program, the Japanese government has adopted a kind of direct subsidy program in order to encourage soybean production since 1974. For example, the government

FIGURE 2 AN EXAMPLE OF 1980 CASE

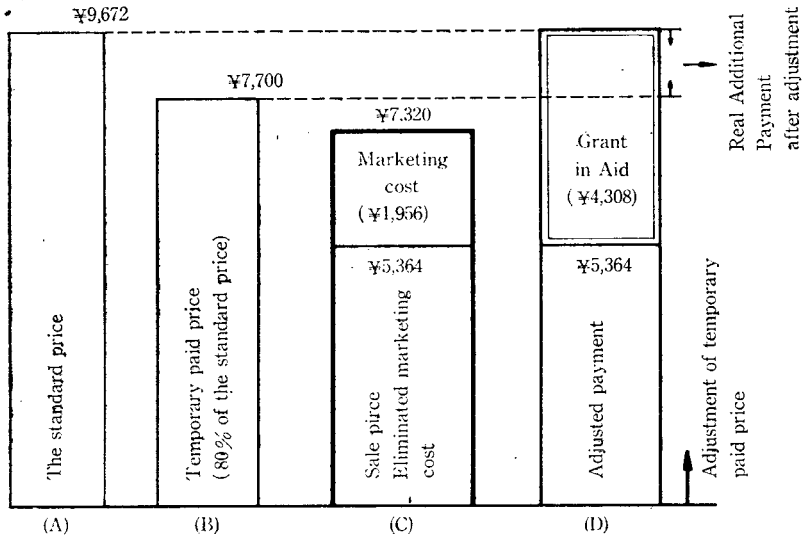
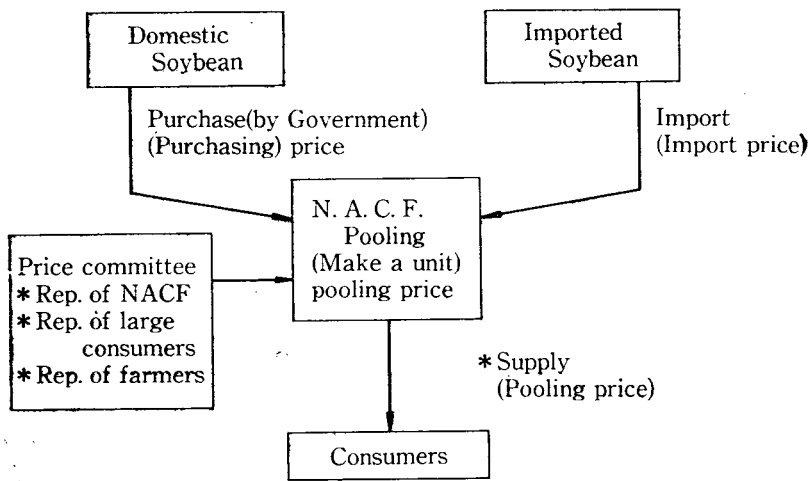


FIGURE 3 MECHANISM



NACF : National Agricultural Cooperative Federation

paid ¥3,000 per 60 kg of soybean to soybean farmers in 1974 in addition to the price supporting scheme.

Korea has also adopted the price support policy for domestic soybean production for a long time. This has been implemented as a part of the government's grain control program. Under this scheme the government has purchased soybeans at government purchasing prices from farmers and resold them to large consumers at a pooling price with imported soybeans.

2. Policy impact on price.

Owing to the government's price support policies, soybean prices in the region have revealed a large increase during the decade. For example, soybean prices in ROC and Korea have increased by 228.9% and 671.8% each, which is a much higher rate than the increase of the whole farm price index 190.7% in ROC and 490.8% in Korea as shown in Table 5.

These large increases in soybean prices were mainly led by the higher level of government guaranteed prices. In fact, the ratio of farm household sale price to the import price in 1981 in the ROC, Japan and Korea was

TABLE 4 COMPARISON OF LOCAL AND IMPORT PRICES

			Unit: ROC: NT\$/kg			
			Japan: ¥/kg			
			Korea: W/kg			
			1975	1980	1981	1982
ROC	Local price	Government guaranteed price	10	17	22	25
		Farm household sale price ¹⁾	11	16	22	23
		Wholesale price ¹⁾	12	17	19	20
	Imported price (C & F) ²⁾		10	11	13	11
Japan	Local price	Government guaranteed price (Basic price)	174('76)	280	287	287
		Farm household sale price ³⁾	181('76)	256	270	284
		Wholesale price ³⁾	174('76)	280	287	
	Imported price			68	73	
Korea	Local price	Government purchasing price (2nd grade)	220	540	696	747
		Farm household sale price ⁴⁾	176	528	767	727
		Wholesale price ⁴⁾	174	497	767	727
	Imported price ⁴⁾		116	195	243	201 ⁵⁾

Source: 1) Taiwan Agricultural Prices Monthly, April, 1983.

2) Commodity-Price Monthly Taiwan Area, DGBAS, ROC, April 1983.

3) Monthly Statistics of Agriculture, Forestry and Fisheries, Government of Japan, April 1983.

4) Monthly Review, National Agricultural Cooperative Federation of Korea, May 1983.

5) Total value of import/total amount of import

TABLE 5 TRENDS IN SOYBEAN PRICES

Countries	Items	1972	1975	1980	1981	Increasing (’72-’81) Percent(%)
ROC	Farm price index	34.4	58.8	80.9	100.0	190.7
	Crop price index	32.7	54.9	78.9	100.0	205.8
	Vegetable price index	26.6	47.2	63.3	100.0	275.9
	Special crop price index	36.1	49.9	83.8	100.0	177.0
	Fruit price index	31.9	51.7	87.2	100.0	213.5
	Soybean price index	30.4	50.0	70.9	100.0	228.9
	Rice price index	35.0	79.1	95.0	100.0	185.7
	Corn price index	110.1	68.4	80.4	100.0	9.1
	Peanut price index	23.6	52.1	59.0	100.0	323.7
	Green bean price index	—	—	—	—	—
Korea	Red bean price index	—	43.8	65.5	100.0	—
	Farm price index	21.7	39.2	100.0	128.2	490.8
	Grain price index	20.0	38.3	100.0	123.3	516.5
	Vegetable price index	21.0	40.9	100.0	132.2	530.0
	Industrial crop price index	32.0	45.7	100.0	113.2	253.8
	Soybean price index	18.8	33.3	100.0	145.1	671.8
	Rice price index	19.9	38.1	100.0	116.8	486.9
	Corn price index	21.3	43.1	100.0	109.9	416.0
	Peanut price index	15.4	42.2	100.0	132.2	758.2
	Green bean price index	14.7	36.0	100.0	207.6	1,312.2
	Red bean price index	17.5	32.0	100.0	156.5	794.3

Source: ROC: *Commodity-price Statistics Monthly*, Taiwan Province, ROC, Dec. 1982.

Korea: *Monthly Review*, National Agricultural Cooperative Federation of Korea, May 1982.

1.7, 3.7 and 2.2 respectively as shown in Table 4. However, even though the soybean prices in the region have shown such a high rate in terms of absolute level due to the government price support policies, they have also shown much detriment for farmers in the terms of relative prices with other highly competitive crops in terms of farm resource utilization. For example, the soybean price in the ROC has increased by 228.9% during the last decade, which is much higher than the increase rate of the whole farm price index but it is much less than the price increase rates of peanuts and special crops which are crops in a severe competitive relationship with soybean production. The soybean price in Korea has also shown higher increase than the rate of whole farm price increases but still much less than the rate of green bean, red bean and peanut price increases as shown in Table 5. This is mainly attributed to the rapid increase in demand for the crops due to the greatly raised consumer income according to the rapid economic development of the countries.

TABLE 6 COMPARISON OF INCOME LEVELS

Country	Crop	Gross Revenue	Production Costs	Net Income
ROC (1981) (NT\$/ha)	Soybean	40,334	37,867	2,467
	Red bean	45,047	35,580	9,467
	Green bean	27,523	42,201	(—) 14,678
	Sweet potato(autumn)	47,151	55,613	(—) 8,462
	Corn(winter)	46,738	44,326	2,412
	Peanut(autumn)	83,915	71,036	12,879
	Rice(1st crop)	74,361	70,128	4,233
	(2nd crop)	66,983	67,024	(—) 41
Japan (1980) (¥/10a)	Soybean	46,743	48,826	(—) 2,083
	Red-bean	45,254	55,678	(—) 10,424
	Cucumber	1,159,694	898,296	261,398
	Tomato	1,323,164	849,203	473,961
	Rice*	138,890	148,766	(—) 9,876
Korea (1976) (W/10a)	Soybean	35,641	37,640	(—) 1,999
	Red bean	30,818	33,962	(—) 3,144
	Green bean	24,705	33,170	(—) 8,465
	Peanut	67,932	61,940	5,992
	Sweet potato	54,160	56,001	(—) 1,841
	Pepper	190,390	105,061	85,329

* For 1979

Source: ROC: Miss Y.O. Chen, Chief, Economic Planning Division, CAPD.

Japan: Agricultural Statistic Book, Government of Japan, 1982.

Korea: Standard Income Analysis of Crops and Livestocks, NAERI, 1976.

vide soybean farmers with sufficient incentives for the increase of soybean production. The stagnation of soybean production in this region, in spite of the governments strong price supporting policies can be explained by the two facts. Firstly, the increase in yields in soybean production in the region has shown a much lower increase than that of its competitive crops. Secondly, it also has not enjoyed higher prices than the competitive crops, most of which are high income elasticity crops which has shown rapid increase in consumption due to vastly raised consumer's income.

4. Impact on trade

Since the government's price support policies could not bring about corresponding soybean production increase, the increase in soybean consumption has resulted in the same increase in its importation. However, it is true that the government price support policies have played a certain restrictive role in the increase of soybean consumption. A study¹ which was carried out in Taiwan revealed that the price response to soybean consumption, i.e. the price elasticity of soybean consumption, was estimated (-)

¹ Estimated by Y.K. Chung, Agricultural Economist, FFTC/ASPAC

TABLE 7 COMPARISON OF YIELD

		Unit: kg/ha			
		1969	1980	1981	Increase
		-71(A)		(B)	A-B/A (%)
ROC	Soybean	1,525	1,692	1,543	1.2
	Rice	3,065	3,695	3,563	16.2
	Corn	2,740*	2,878	2,730	(—) 1.3)
	Sweet potato	15,044	16,949	15,314	1.8
	White potato	11,650*	12,170	12,046	(3.4)
	Peanuts	1,397	1,617	1,607	15.0
	Green bean	422*	688	744	(76.3)
	Red bean	1,778*	1,898	1,817	(2.2)
		15,374*	18,484	17,736	(15.4)
Japan	Soybean	1,286	1,223	1,458	13.4
	Corn	2,674	1,989	3,000	21.2
	Sweet potato	19,356	20,324	20,324	5.0
	White potato	21,258	27,723	25,896	21.8
	Peanuts	2,038	1,651	1,818	(—) 10.8
	Green bean	—	1,650	1,930	—
	Red bean	1,210	1,000	980	(—) 19.1
	Cabbage	32,061	35,544	35,602	11.0
Korea	Soybean	783	1,150	1,270	62.2
	Corn	1,490	4,360	4,380	194.0
	Sweet potato	16,533	20,050	22,140	33.9
	White potato	11,110	11,930	13,500	21.5
	Peanuts	1,177	1,058	2,273	93.1
	Green bean	530*	840	820	54.7
	Red bean	650*	900	980	50.8
	Cabbage	12,386	62,230	67,126	442.0

* Indicates 1972 yield

Source: ROC: *Taiwan Agricultural Yearbook*, Taiwan Provincial Government, 1982.
Japan and Korea: *FAO Production Yearbook* (1981)

0.63047 by the following equation:

$$\log Y_t = \log 4.577 - 0.6047 \log X_1 + 0.69595 \log X_2 + 1.2758 \log X_3$$

(7.03) (0.362) (0.368) (1.01)

$$R^2 = 83.9$$

$$D - W \text{ ratio} = 1.5119$$

Where,

 Y_t : The amount of soybean consumption at t year. X_1 : Soybean real price (farm household price) at t year. X_2 : Per capita real income at t year. X_3 : No. of population at t year.

And even the proportion of the domestic soybean to the total amount of soybean consumption was very low, the government price support policies for the domestic soybean caused, more or less, the increase in soybean prices. For example, the government's price supporting schemes caused an

TABLE 8 THE IMPACT ON CONSUMER PRICES, 1981

Unit: 1,000 M/T

Countries:	ROC	Japan	Korea
Amount of domestic production (A)	16	174	216
Amount of import (B)	1,113	4,401	529
Price ratio domestic/import	1.7	3.9	2.9
The percentage of consumer price increase(%)	1.4	12	62

increased in consumer prices of 1.4% in ROC, 12% in Japan and 62% in Korea in 1981 under the assumption that it was formulated as a pooling price of the governments guaranteed price and import price as shown in Table 8.

In this regard, the government price support schemes seem finally to result in the decrease in soybean consumption and soybean imports. In fact, the increased price of soybeans has brought about the increased palm oil import as a substitution for soybeans in Japan.

III. Conclusion

The government's price support policies in the region have brought about many problems such as distorted price system, waste of financial resources and the price increase of final products, etc. rather than brought about expected favorable effect on domestic soybean production. This is mainly due to the slower increase of yields in soybeans than in competitive crops. Therefore, it seems to be better for the countries in the region to pay more attention to the increase of yield than the continuous strengthening of the price support policies.

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