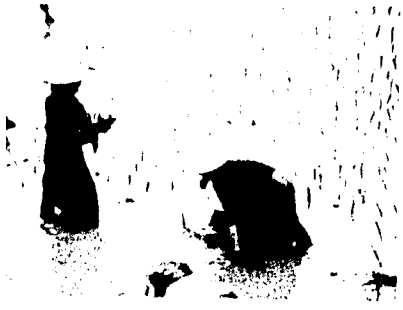
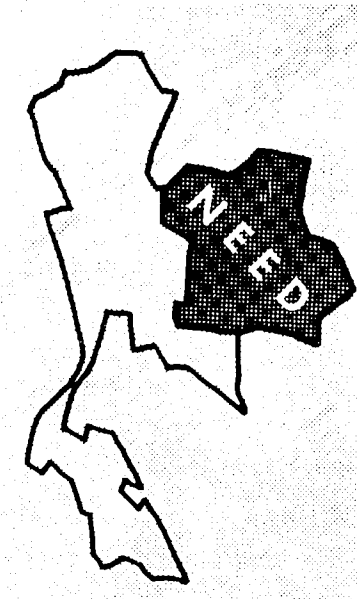
NORTHEAST ECONOMIC DEVELOPMENT

PLANNING ADVISORY GROUP





PLANNING REPORT APPENDIX

PLAN METHODOLOGY MARKET ANALYSIS MAINTENANCE REQUIREMENTS

STAGE 3

APPENDICES
NEED STAGE 3 PLANNING REPORT

A. METHODOLOGY TO DETERMINE PLANNED SECTOR AND SUB-SECTOR GROWTH RATES AND TARGETS

B. MARKETING: DEMAND AND DISTRIBUTION CONDITIONS IN NORTHEAST THAILAND

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APPENDIX A

NEED Stage 3 Planning Report

METHODOLOGY TO DETERMINE PLANNED SECTOR AND SUB-SECTOR GROWTH RATES AND TARGETS

Appendix A: METHODOLOGY TO DETERMINE PLANNED SECTOR AND SUB-SECTOR GROWTH RATES AND TARGETS

The Regional Plan

A Regional Development Plan is a list of programs and projects - integrated into a regional planning framework - which will be undertaken by the government. The methodology described here is intended to evaluate their broad benefits in terms of the programs themselves and of the whole regional economy. In the ultimate plan document budgets for each (over the plan period), will be detailed, but this is not considered here. Estimates of the benefits which will accrue from the programs will be determined whether they are social, political or economic, but this appendix is concerned solely with quantitative estimates of the economic benefits. Some of the program targets have to be described qualitatively, but most can also be estimated quantitatively through the effect the program has on the growth of the economy, and consequently can be described by a planned growth rate. The Regional Accounts production tables are used as the basis of these estimates.

Plan Programs

In developing this methodology it was first necessary to consider what programs make an effective regional plan. Some are broad in scope covering large sectors of the economy, but at the regional level many must be quite specific and related to a particular productive activity. For example, in considering the broad quideline which stresses the importance of moving from subsistence into more commercial agriculture it is necessary to analyze programs for individual candidate crops. The benefits, constraints, and costs of a program designed to increase the production of cotton are different from those for tobacco, or soy beans.

The planned growth rate for "all cash crops" is an aggregate of the growth rate for the individual cash crops, and the methodology adopted is based on this premise. In determining which productive activities should be included as individual items it was decided to include all of those which have one or more of the following characteristics:-

(1) Are of significant value
(2) Are individual and can be planned individually
(3) Compete for resources with other activities
(4) Are individually dependent on another individual activity
(5) Are individually important because of equity considerations, or other social or political reasons.

The number of activities meeting these criteria is large, and, using the Regional Accounts Production tables as a basis, a list of 90 line items was drawn up. The sum of the production (in terms of value added) from each of the 90 activities represents the gross regional product. When the activities are projected through the plan period 1972-76 on the assumption that particular development programs are implemented, the resulting values added reflect the benefits of the programs and in aggregate show the effect on the overall gross regional product and its growth rate. Consideration of the change in value added to the individual activity combined with the resulting effect on the gross regional product is the basis for the determination of the quantitative regional benefits derived from a particular program.

Analytical Method

Because there is very little aggregation of individual production activities into sub-sector or sector activities in the initial stages of analysis, the model is much more specific than it otherwise would be. This is believed to be necessary in a method designed primarily to help to evaluate specific practical development programs at the regional level.

Being so specific makes it possible to employ the precise correlations which can be developed between a particular individual activity and other related activities. Also relationships with relevant factors such as population growth, land availability, product demand, etc., can be used directly in determining planned targets for individual productive activities. The role of macro-analysis (involving the behaviour of complete sectors and regions of the economy) in addition to determining background for the formulation of guidelines is to obviate the danger that individual targets which by themselves appear reasonable, when aggregated do not seem so. But in every important respect the planning methodology has been designed to handle specific individual projects and programs and to compare the relative advantages one against the other.

Details of Method

The method chosen to determine the benefits of each development program is to calculate its impact by projection from the Gross Regional Production series for the years 1960-1969 as prepared by the Regional Accounts Section of NEDB. The summary work sheet for this is shown as Table A-1. The first column enumerates all the products which contribute to the gross regional product. The next ten columns show the value added for them in constant 1962 prices as determined by the Regional Accounts Section. A "Historical Growth Rate" comes next, which is a strictly arithmetic compound annual growth rate between the mean of 1960, 1961 and 1962, and the mean of 1967, 1968 and 1969. The current growth rate is the analyst's estimate; if the growth curve is relatively normal then the current growth is that between the mean of 1966 and 1967 and the mean of 1968 and 1969.

Analysis of Northeast regional resources taken together with historic and current production trends, demand trends, production constraints (land etc.), and demand constraints (World markets, etc.),

has led to proposals to initiate projects and programs in many sectors. In Table A-1 the value added for each of the line items for the year 197[illegible] to end of the plan period in 1976 takes into account the effects of their introduction.

The methodology developed to assist this analysis includes a simple Correlation Matrix Table A-2 made up basically on the two axes by the line items of Table A-1. Additionally on one axis are other relevant correlating factors such as population, demand, whole kingdom production, Thai institutions, product quality and so on. The matrix is at this stage largely qualitative, but is does include many quantitative correlations, and these are recorded in a supporting dossier for each of the line items. It is intended that the dossier shall include the latest (but only the latest) supporting data as well as the corresponding quantitative correlations. The complete series is included in this appendix. Some of the line items of the value added series are simple aggregates of other lines, and it is sufficient only to aggregate all the lines to get a regional gross product and its annual growth rate, These have been checked for consistency and general reasonableness with past growth and planned national growth.

NORTHEAST THAILAND

FIVE YEAR DEVELOPMENT PLAN — APPENDIX A-1

1972 — 1976

PLANNED GROWTH RATES AND TARGETS.

No.	Sector	Value added at constant 1962 prices, million baht: 1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	Historical growth rate (average-average) 1961–1966 compound	Current trend % growth rate	1970	1971	Plan period: 1972	1973	1974	1975	1976	Growth rate 1969–1976	
1	PADDY	2,446	2,488	3,231	3,461	3,166	2,866	4,036	2,460	3,460	3,869	3.4 %	2.4 %	3,849	3,960	4,110	4,258	4,400	4,580	4,208	3.4 %	
3	COCONUT	31	33	34	46	46	46	46	43	44	45	2.9 %	1.1 %	46	46	45	45	45	46	45	0.0 %	PADDY
4	SUGARCANE	93	74	56	59	92	68	50	47	54	61	-4.6 %	9.0 %	60	60	60	60	60	60	60	0.0 %	COCONUT
5	MAIZE & SORGHUM	110	54	46	46	46	62	98	98	103	122	5.7 %	14.0 %	133	144	157	171	186	202	220	8.0 %	SUGARCANE
6	GROUNDNUTS	81	75	57	83	71	77	73	69	69	79	-0.4 %	2.1 %	79	79	79	79	79	79	79	0.0 %	MAIZE & SORGHUM
7,8,9	BEANS (MUNG, CASTOR, SOY)	44	38	34	30	30	30	29	22	22	25	-7.7 %	-4.2 %	26	27	29	31	33	35	37	6.4 %	GROUNDNUTS
10	CASSAVA	14	13	14	21	23	38	29	38	17	50	16.2 %	25.0 %	52	54	55	57	59	61	64	3.3 %	BEANS (MUNG, CASTOR, SOY)
11	TOBACCO	160	132	73	106	97	107	122	120	124	137	1.2 %	3.2 %	144	151	159	167	175	184	193	5.0 %	CASSAVA
12	COTTON	74	43	48	39	46	46	60	60	73	94	4.5 %	19.0 %	89	98	106	118	130	143	156	9.8 %	TOBACCO
13	KENAF	333	483	246	386	562	964	1,325	956	360	706	10.4 %	0.0 %	636	636	636	636	636	636	636	0.0 %	COTTON
14	KAPOK	70	65	52	60	63	63	61	62	55	56	-2.0 %	0.0 %	57	57	57	57	57	57	57	0.0 %	KENAF
15	SESAME	22	16	9	8	8	12	11	6	6	8	-15.0 %	0.0 %	9	9	9	9	9	9	9	0.0 %	KAPOK
16	GARLIC (ETC.)	146	213	196	244	175	172	181	172	181	197	-0.2 %	3.3 %	204	210	217	224	232	230	247	3.3 %	SESAME
17	VEGETABLES	30	39	49	71	73	74	112	120	132	144	18.9 %	9.3 %	154	166	179	194	210	228	247	8.1 %	GARLIC (ETC.)
18	FRUIT & OTHERS	650	702	696	693	513	555	595	611	648	691	0.0 %	5.5 %	710	741	772	801	830	867	884	3.8 %	VEGETABLES
19	ALL CROPS EXCEPT PADDY & KENAF	1,636	1,497	1,273	1,565	1,296	1,364	1,404	1,453	1,557	1,637	1.0 %	6.2 %	1,761	1,838	1,924	2,013	2,105	2,199	2,296	4.6 %	FRUIT & OTHERS
20	ALL CROPS	4,311	4,379	4,750	5,419	5,046	5,200	6,656	4,879	5,372	6,232	2.9 %	2.9 %	6,346	6,454	6,673	6,804	7,141	7,365	7,639	3.2 %	ALL CROPS EXCEPT PADDY & KENAF
21,22	CATTLE & BUFFALO	323	329	379	407	365	363	426	426	445	466	3.6 %	3.4 %	484	504	524	545	567	600	633	4.3 %	ALL CROPS
23	SWINE	156	170	166	219	180	169	236	256	276	281	6.6 %	6.6 %	318	374	397	422	448	476	505	6.0 %	CATTLE & BUFFALO
24	HENS & DUCKS	266	271	281	290	301	309	320	331	342	353	3.5 %	3.5 %	365	377	389	402	415	426	441	3.2 %	SWINE
25	EGGS	196	209	192	195	206	213	214	221	230	236	2.0 %	3.5 %	244	253	262	271	280	290	300	3.3 %	HENS & DUCKS
26,27	OTHERS (INCL. DAIRY)	10	9	9	9	8	11	12	13	13	13	4.9 %	2.0 %	14	14	15	16	17	17	19	4.9 %	EGGS
28	LIVESTOCK	853	987	1,048	1,120	1,079	1,085	1,208	1,247	1,308	1,349	3.9 %	4.1 %	1,425	1,522	1,587	1,656	1,727	1,811	1,897	4.9 %	OTHERS (INCL. DAIRY)
32,33,34	TIMBER	60	72	94	121	125	155	165	200	213	186	14.6 %	4.4 %	204	224	246	271	296	326	360	10.0 %	LIVESTOCK
35	CHARCOAL & FIRE WOOD	235	262	281	291	278	271	277	251	262	271	0.3 %	0.4 %	271	271	271	271	271	271	271	0.0 %	TIMBER
36	OTHER FOREST PRODUCTS	58	63	66	69	112	95	67	66	95	124	6.0 %	3.3 %	131	139	146	157	166	179	186	6.0 %	CHARCOAL & FIRE WOOD
37	FORESTRY	358	387	443	492	513	521	499	517	570	580	4.6 %	6.5 %	606	634	665	699	635	775	817	6.1 %	OTHER FOREST PRODUCTS
30,31	FISHING	153	156	176	166	189	250	276	268	290	313	6.7 %	5.2 %	329	346	364	383	403	434	446	5.2 %	FORESTRY
38	ALL AGRICULTURE	5,775	5,909	6,417	7,190	6,827	7,062	6,838	6,911	7,540	8,474	5.4 %	1.3 %	8,606	8,956	9,291	9,642	10,008	10,390	10,799	3.73%	FISHING
	MINING (NON CONSTRUCTION)	1	1	1	0	0	0	0	0	0	0	0.0 %	0.0 %	0	0	0	0	0	0	0	0.0 %	ALL AGRICULTURE
39	QUARRYING (CONSTRUCTION)	17	17	21	28	52	62	134	188	219	246	42.6 %	1.6 %	251	243	235	228	230	233	244	0.9 %	MINING (NON CONSTRUCTION)
40	CONSTRUCTION (PRIVATE)	380	399	434	511	544	651	623	646	705	729	7.9 %	6.1 %	776	827	881	936	999	1,064	1,133	6.5 %	QUARRYING (CONSTRUCTION)
41	CONSTRUCTION (PUBLIC)	22	27	40	61	198	291	508	725	750	895	59.8 %	15.0 %	800	700	600	500	450	400	400	-14.0 %	CONSTRUCTION (PRIVATE)
42	ALL CONSTRUCTION	412	426	471	572	742	943	1,131	1,373	1,455	1,624	19.1 %	10.6 %	1,576	1,527	1,481	1,436	1,449	1,464	1,533	-1.2 %	CONSTRUCTION (PUBLIC)
43	SLAUGHTER HOUSES	62	95	129	137	111	116	128	120	100	100	1.6 %	-12.0 %	104	119	166	212	330	424	561	33.0 %	ALL CONSTRUCTION
44	RICE MILLS	346	373	423	519	510	417	441	526	424	582	4.4 %	2.0 %	613	633	655	677	700	724	749	3.4 %	SLAUGHTER HOUSES
45	SUGAR MILLS	8	11	10	8	11	22	18	16	13	13	5.4 %	-14.0 %	18	18	19	19	20	20	21	4.5 %	RICE MILLS
46	OTHER FOOD	44	44	46	47	51	51	58	54	62	64	4.4 %	4.4 %	67	70	73	76	79	83	86	4.3 %	SUGAR MILLS
47	ALL FOOD MANUFACTURES	459	527	608	712	683	607	646	716	600	739	3.9 %	0.0 %	802	840	913	984	1,146	1,281	1,417	9.6 %	OTHER FOOD
48	DISTILLERIES	14	27	40	43	42	44	50	44	31	39	5.0 %	-16.0 %	42	45	48	51	55	59	63	6.8 %	ALL FOOD MANUFACTURES
49	SOFT DRINKS	9	9	9	10	14	14	16	15	16	16	6.3 %	3.2 %	17	18	31	46	53	66	84	28.0 %	DISTILLERIES
50	TOBACCO	56	67	46	67	80	45	56	52	56	61	-0.1 %	4.0 %	62	65	68	143	147	152	163	20.0 %	SOFT DRINKS
51	WEARING APPAREL	43	48	46	49	52	65	66	75	78	84	6.6 %	6.5 %	90	96	102	109	118	123	131	6.5 %	TOBACCO
52	COTTON PROCESSING	47	49	50	62	64	56	56	80	62	64	3.6 %	3.3 %	68	73	78	83	88	139	189	15.0 %	WEARING APPAREL
53	GUNNY BAGS	9	12	23	29	56	67	79	95	92	106	30.0 %	7.0 %	110	132	139	149	153	161	169	6.7 %	COTTON PROCESSING
54	SILK	85	86	91	94	97	101	104	108	111	116	3.5 %	3.3 %	126	137	149	163	177	193	210	9.0 %	GUNNY BAGS
55	MATS	30	31	33	34	35	36	37	39	40	41	3.3 %	3.8 %	43	44	45	47	48	50	52	3.2 %	SILK
	OTHER TEXTILES	11	14	9	11	14	19	21	16	12	13	1.1 %	-23.0 %	14	15	17	18	19	22	25	9.5 %	MATS
56	ALL TEXTILES	182	194	206	220	265	298	296	316	317	339	7.5 %	3.4 %	361	401	428	457	496	565	645	9.0 %	OTHER TEXTILES
57	WOOD & CORK	35	44	65	61	82	92	109	133	161	197	19.0 %	22.0 %	213	230	246	268	290	313	336	8.0 %	ALL TEXTILES
58	FURNITURE	6	7	9	13	13	16	20	20	23	21	12.0 %	6.0 %	23	25	28	31	34	37	41	10.1 %	WOOD & CORK
59,60,61,62,63	OTHER (MACHINE SHOPS ETC)	71	83	97	109	123	137	150	169	196	203	12.3 %	12.0 %	226	253	292	346	401	450	511	14.9 %	FURNITURE
64	ALL MANUFACTURES	875	1,004	1,126	1,304	1,334	1,318	1,412	1,539	1,477	1,719	6.7 %	4.1 %	1,836	1,973	2,158	2,437	2,731	3,008	3,373	10.3 %	OTHER (MACHINE SHOPS ETC)
65,66	ELECTRICITY & WATER	13	17	22	24	31	41	62	91	161	210	36.6 %	55.0 %	237	266	312	345	384	429	482	12.7 %	ALL MANUFACTURES
67	TRANSPORT (PRIVATE)	246	303	347	364	360	406	514	529	646	203	11.5 %	11.0 %	760	866	961	1,067	1,185	1,316	1,460	11.0 %	ELECTRICITY & WATER
68 69	TRANSPORT (PUBLIC)	57	66	68	84	82	73	72	85	94	90	3.9 %	9.7 %	106	100	96	100	105	110	115	2.0 %	TRANSPORT (PRIVATE)
70	COMMUNICATION	11	12	13	12	16	22	30	36	39	41	16.6 %	6.5 %	45	50	55	60	66	73	80	10.0 %	TRANSPORT (PUBLIC)
71	TRADE OF IMPORT INTERMEDIATE GOODS	46	47	37	37	37	27	27	36	39	44	-1.8 %	15.0 %	48	53	59	65	71	79	86	10.1 %	COMMUNICATION
72	TRADE OF IMPORT CAPITAL GOODS	97	119	148	174	209	230	338	428	454	543	21.5 %	14.0 %	570	599	629	660	693	728	764	5.0 %	TRADE OF IMPORT INTERMEDIAT GOODS
73	TRADE OF IMPORT CONSUMER GOODS	384	439	484	479	526	548	591	666	703	753	7.6 %	7.5 %	900	949	902	956	1,017	1,074	1,134	6.1 %	TRADE OF IMPORT CAPITAL GOODS
74	TRADE OF DOMESTIC AGRICULTURE	464	446	373	475	484	555	635	644	586	626	3.4 %	-2.7 %	652	693	737	783	832	884	939	6.2 %	TRADE OF IMPORT CONSUMER GOODS
75	TRADE OF MINING AND MANUFACTURES	213	241	276	292	279	290	386	427	447	475	9.1 %	6.5 %	520	568	622	688	744	814	891	9.4 %	TRADE OF DOMESTIC AGRICULTURE
76	WHOLE SALE & RETAIL TRADE	1,207	1,291	1,320	1,487	1,535	1,650	1,976	2,201	2,229	2,441	6.6 %	6.7 %	2,580	2,762	2,946	3,146	3,357	3,578	3,814	6.6 %	TRADE OF MINING AND MANUFACTURES
77	BANKING	22	22	33	37	42	62	64	80	94	104	19.0 %	19.0 %	116	128	142	158	176	196	216	11.0 %	WHOLE SALE & RETAIL TRADE
78	INSURANCE & REAL ESTATE	9	6	10	11	11	13	19	26	28	34	16.8 %	19.0 %	39	45	52	59	67	77	89	14.6 %	BANKING
79	EDUCATION	301	328	358	367	419	446	466	508	558	632	6.1 %	10.0 %	706	796	824	849	874	899	924	5.0 %	INSURANCE & REAL ESTATE
80	MEDICAL & HEALTH	70	75	84	68	96	105	119	134	148	166	10.1 %	11.0 %	184	202	220	246	266	290	317	9.5 %	EDUCATION
81	RECREATION & ENTERTAINMENT	40	47	57	66	72	90	93	111	133	157	15.8 %	19.0 %	167	180	195	211	226	247	266	8.1 %	MEDICAL & HEALTH
82	DOMESTICS	62	63	66	68	71	73	76	79	81	83	3.5 %	3.1 %	86	94	99	106	112	119	126	6.2 %	RECREATION & ENTERTAINMENT
83	HOTELS & RESTAURANTS	136	147	168	180	201	223	249	289	341	406	13.3 %	19.5 %	442	476	514	555	602	652	708	8.0 %	DOMESTICS
84	LAUNDRIES, BABER SHOPS ETC	56	58	60	64	67	71	75	82	96	100	6.9 %	1.0 %	107	116	128	131	141	151	161	7.0 %	HOTELS & RESTAURANTS
85	RELIGIOUS, ETC.	111	134	162	190	217	254	282	314	336	361	13.9 %	8.0 %	363	407	432	459	486	519	550	6.2 %	LAUNDRIES, BABER SHOPS ETC.
86	ALL SERVICES	776	851	942	1,042	1,143	1,251	1,380	1,518	1,709	1,809	10.4 %	8.6 %	2,079	2,272	2,412	2,550	2,711	2,876	3,084	6.6 %	RELIGIOUS, ETC.
87	OWNERSHIP OF DWELLINGS	250	254	257	264	272	279	287	295	304	312	2.6 %	2.8 %	327	342	358	375	393	411	431	4.8 %	ALL SERVICES
88	PUBLIC ADMIN & DEFENCE	444	466	489	532	547	591	591	647	743	810	6.7 %	12.0 %	801	1,002	1,114	1,239	1,377	1,531	1,703	11.2 %	OWNERSHIP OF DWELLINGS
89	NON AGRICULTURAL SECTORS	4,342	4,748	5,144	5,723	6,186	6,773	7,682	8,687	9,186	10,246	10.2 %	12.7 %	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	7.2 %	PUBLIC ADMIN & DEFENCE
90	NORTHEAST REGION PRODUCT	10,116	10,654	11,561	12,913	13,013	[illegible]	[illegible]	15,576	16,726	18,722	6.9 %	8.5 %	18,466	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8.8 %	NON AGRICULTURAL SECTORS
																						NORTHEAST REGION PRODUCT
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969			1970	1971	1972	1973	1974	1975	1976		

Source: Assembled by NEED PAG

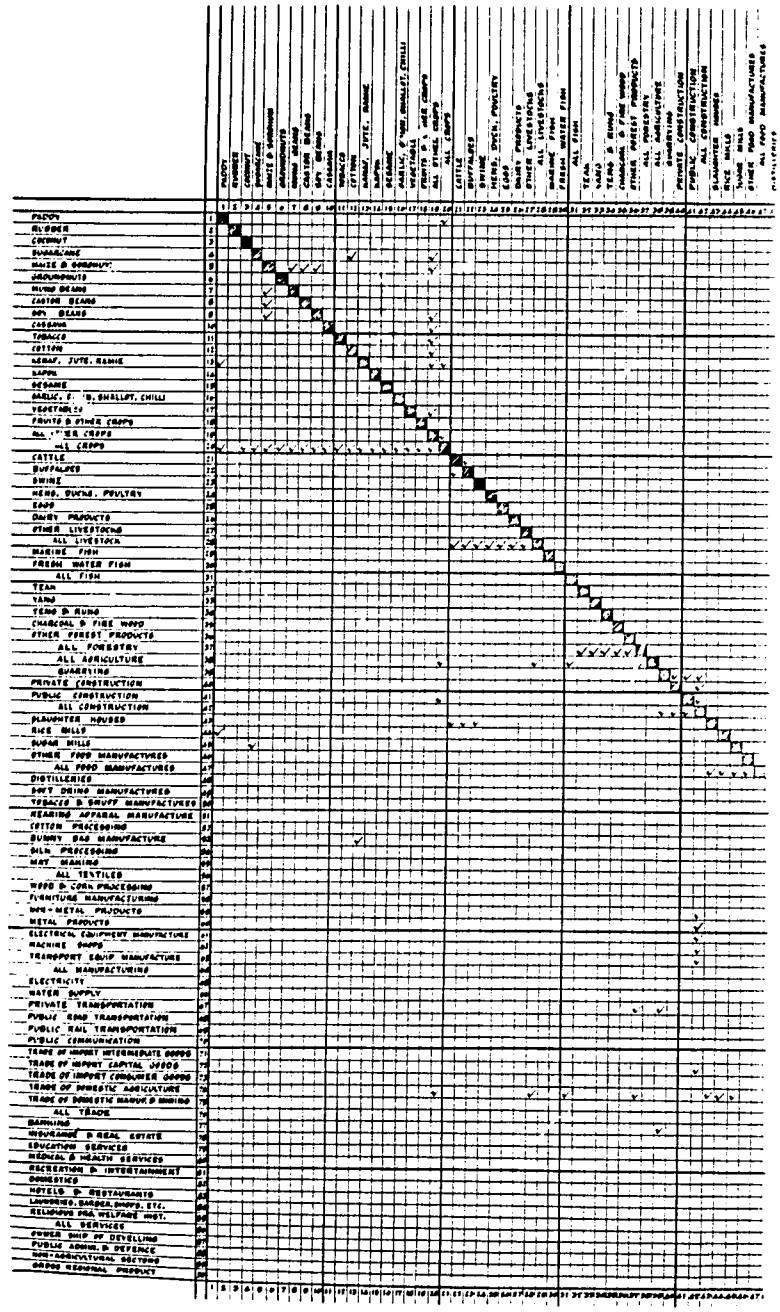
Based on NEDB, National Accounts Division Data.

NORTHEAST TH

FIVE YEAR DEVELOPI

1972 – 1976

CORRELATION



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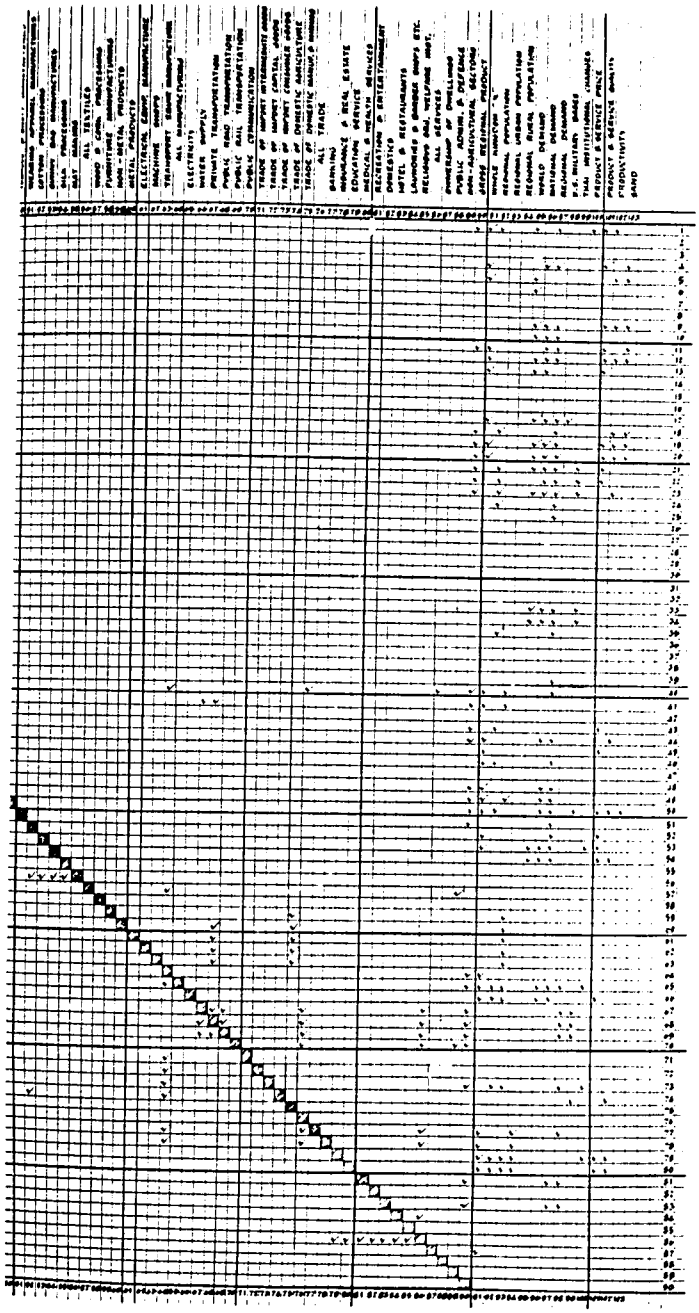

CORRELATIONS and RELATIONSHIPS

Line Item 1: PADDY

Quantitative Correlation

$$\text{Paddy}_n = \text{Paddy}_1 \left(\frac{100 + \text{Population Growth Rate}}{100}\right)^n$$

Paddy_1 is paddy value added derived for 1969 by fitting a curve to the 1940-68 series for paddy value added.

The numerical value is:-

$$\text{Paddy}_n = 3600 \left(\frac{103.0}{100}\right)^n \text{ million baht}$$

Other relationship

Regional paddy production related to:-

(1) All regional crop production.

(2) Gross regional production.

(3) National paddy production.

(4) World paddy demand.

(5) Regional paddy demand.

(6) Paddy price.

(7) Paddy quality.

(8) Productivity.

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* Only those line items which reflect significant production in Northeast Thailand are considered.

Line Item 4: SUGARCANE

Quantitative Correlation

$$Sugarcane_n = Sugarcane_1 = Constant = 60 \text{ million baht}$$

Other relationships

Regional sugarcane production related to:-

(1) Regional Cotton Production.

(2) All other crops (excluding paddy).

(3) National sugarcane production.

(4) National sugarcane demand.

(5) Regional sugarcane demand.

(6) Sugarcane quality.

(7) Productivity.

Line Item 5: MAIZE and SORGHUM

Quantitative Correlation

Market is not a limitation, land availability and productivity is.

Area x productivity = Crop production

Assume and increase of x% per annum in land

y% per annum in productivity

and z% in production

N.B.:-

Then:-

$$\text{Area}_1 \left(\frac{100 + x}{100}\right)^n \times \text{Productivity}_1 \left(\frac{100 + y}{100}\right)^n$$

$$= \text{Production}_1 \left(\frac{100 + z}{100}\right)^n$$

As a first approximation this is:-

$$X + y = Z$$

It is assumed $x = 3\%$ per annum

$y = 5.8\%$ per annum

Then $Z = 8.8\%$ per annum

Maize production in 1969 was 122 million baht.

$$\therefore \quad \text{Maize}_n = 122 \left(\frac{108.8}{100}\right)^n$$

Other relationships

Regional Maize & Sorghum production related to:-

(1) Regional bean (particularly soy) production.

(2) All other crop production in region.

(3) National Maize & Sorghum production.

(4) World demand for Maize & Sorghum.

(5) National demand for Maize & Sorghum.

(6) Land availability.

Line Item 6: GROUNDNUTS

Quantitative Correlation

Groundnuts_n = Groundnuts, = Constant = 79 million baht.

Other relationships

Regional groundnut production related to:-

(1) World demand

(2) Whole Kingdom demand.

Line Items 7, 8, 9: BEANS

Quantitative Correlation

$$\text{Beans}_n = \underset{1969}{\text{Mung Bean}} + \underset{1969}{\text{Castor Bean}} + (n-2)\underset{1971}{(\text{Soybeans})}$$

Soy Beans 1971 = Production from 16,000 rai of irrigated land and results in about 2.1 million baht value added.

Beans_n = 25 + (n-2)(2.1) million baht

Other relationships

Regional Soy bean production related to:-

(1) All regional other crop production.

(2) World Soy bean demand.

(3) National Soy bean demand.

(4) Regional Soy bean demand.

(5) Product quality

(6) Productivity

(7) Land availability (Maize alternative use)

Line Item 10: CASSAVA

Quantitative Correlation

$$\text{Cassava}_n = \text{Cassava}_1\left(\frac{100 + \text{Whole Kingdom Current Growth Rate}}{100}\right)^n \text{mill.baht}$$

$$\text{Cassava}_1 = \underset{1969}{\text{Cassava}} = 50 \text{ million baht}$$

Whole Kingdom Current Growth Rate = 3.5%

$$\text{Cassava}_n = 50\left(\frac{100 + 3.5}{100}\right)^n \text{ million baht}$$

Line Item 11: TOBACCO

Quantitative Correlation

$$\text{Tobacco}_n = \text{Tobacco}_1\left(\frac{100 + \text{National Consumption Growth Rate}}{100}\right)^n$$

Current National Consumption Growth Rate = 5%

$$\text{Tobacco}_1 = \underset{1969}{\text{Tobacco}} = 137 \text{ million baht}$$

$$\text{Tobacco}_n = 137\left(\frac{100 + 5}{100}\right)^n \text{ million baht}$$

Other relationships

(1) Production of all other crops in region.

(2) National tobacco production.

(3) Gross regional product.

(4) Product quality.

(5) Productivity.

(6) Land availability.

Line Item 12: COTTON

Quantitative Correlation

1) Markets not a limitation.

2) Land available for cotton growing is at a maximum but increased productivity will allow (6.5% growth per annum an existing land.

3) 16,000 additional irrigated rai per year will be available from 1972 onwards.

$$\text{Cotton}_n = \text{Cotton}_1\left(\frac{100 + \text{Productivity Growth Rate}}{100}\right)^n$$

$$+(n-2)(\text{Value added from 16,000 new rai})$$

$$\text{Cotton}_1 1 = \text{Cotton}_{1969} = 84 \text{ million baht}$$

Value added from 16,000 irrigated rai = 5 million baht

$$\text{Cotton}_n = 84\left(\frac{106.5}{100}\right)^n + (n-2)(5)$$

Other relationships

Regional cotton production related to:-

(1) All other crops (excluding paddy)

(2) National cotton production

(3) World cotton demand

(4) Regional cotton demand

(5) Product quality

(6) Productivity

(7) Land availability

Line Item 13: KENAF

Quantitative Correlation

$$Kenaf_n = \text{Constant} = 636 \text{ million baht}$$

Very volatile demand historically. Small internal demand increase balanced by a small external demand decrease.

Other relationships

(1) Paddy production

(2) All regional crops

(3) National production

(4) World demand

(5) National demand

(6) Product quality

Line Item 14: KAPOK

Quantitative Correlation

$$Kapok_n = Kapok_1 = \text{Constant} = 57 \text{ million baht}$$

Other relationships

(1) World demand

(2) Whole Kingdom demand

Line Item 15: SESAME

Quantitative Correlation

$$\text{Sesame}_n = \text{Sesame}_1 = \text{Constant} = 9 \text{ million baht}$$

Line Item 16: GARLIC

Quantitative Correlation

$$\text{Garlic}_n = \text{Garlic}_1 \left(\frac{100 + \text{Current Growth Rate}}{100}\right)^n \text{ million baht}$$

$$\text{Garlic}_1 = \underset{1969}{\text{Garlic}} = 197 \text{ million baht}$$

Current Growth Rate = 3.3%

$$\text{Garlic}_n = 197\left(\frac{100 + 3.3}{100}\right)^n \text{ million baht}$$

Relationships

(1) Population

Line Item 17: VEGETABLES

Quantitative Correlation

$$\text{Vegetables}_n = \text{Vegetables}_1 \left(\frac{100 + 8.1}{100}\right)^n$$

$$\text{Vegetables}_1 = \underset{1969}{\text{Vegetables}} = 144 \text{ million baht}$$

Other relationships:

(1) All other crop production (excluding paddy).

(2) National vegetable production

(3) World demand (Laos)

(4) National demand

(5) Regional demand

(6) U.S. Bases

Line Item 18: FRUIT

Quantitative Correlation

$$\text{Fruit}_n = \text{Fruit}_1 \frac{(100 + \text{Growth Rate}_1)}{100} \frac{(100 + \text{Growth Rate}_2)}{100} \cdots \frac{(100 + \text{Growth Rate}_n)}{100}$$

Growth Rate_n =	4.7	1969
	4.4	1970
	4.1	1971
	3.8	1972
	3.5	1973
	3.3	1974
	3.1	1975

Other relationships:

(1) Gross regional product

(2) Regional population

(3) Regional demand

(4) Availability of suitable land

(5) Productivity

Line Item 19: ALL OTHER CROPS

Quantitative Correlation

$$\text{All other crops}_n = \sum \text{Line Items 3 to 12}_n, \text{ 14 to 19}_n$$

Line Item 20: ALL CROPS

Quantitative Correlation

$$\text{All crops} = \sum \text{Line Items 1 to 18}$$

$$= \text{Line Item 1} + \text{Line Item 13} + \text{Line Item 19}$$

Line Item 21 & 22: CATTLE and BUFFALO

Quantitative Correlations

$$\text{Cattle}_n = \text{Cattle}_1 \left(\frac{100 + \text{per capita income growth rate}}{100} \right)^n + (\text{Export})_n$$

$$\text{Cattle}_1 = \underset{1969}{\text{Cattle}} = 466 \text{ million baht}$$

Per capita income growth rate (assumed) = 4%

$$\text{Export}_n = \text{Export}_7\left(\frac{100 + \text{Export growth rate}}{100}\right)^{n-7}$$

$$\text{Export}_7 = \underset{1975}{\text{Export}} = 10 \text{ million baht}$$

Export growth rate (assumed) = 10%

$$\therefore \text{Cattle}_n = 466\left(\frac{100 + 4}{100}\right)^n + 10\left(\frac{100 + 10}{100}\right)^{n-7} \text{ million baht}$$

Other relationships:

(1) Interrelationship between cattle and buffalo

(2) World demand (Japan)

(3) National demand

(4) Institutional changes

(5) Product quality

Line Item 23: SWINE

Quantitative Correlations

Up to 1971

$$\text{Swine}_n = \text{Swine}_1\left(\frac{100 + \text{Historic Growth Rate}}{100}\right)^n$$

$$\text{Swine}_1 = \underset{1968}{\text{Swine}} = 278 \text{ million baht}$$

Historic growth rate = 7%

$$\text{Swine}_n = 278\left(\frac{100 + 7}{100}\right) \text{ million baht}$$

1972

$$\text{Swine}_{1972} = \text{Swine}_{1971}\left(\frac{100 + 7}{100}\right)\left(\frac{100 + \text{Growth rate increase due to institutional changes}}{100}\right)$$

Swine_{1971} = 340 million baht

Growth rate due to institutional changes (Assumed) = 10%

$$\text{Swine}_{1972} = 340\ \left(\frac{107}{100}\right)\ \left(\frac{100 + 10}{100}\right)$$

1973 Onwards

$$\text{Swine}_{n} = \text{Swine}_{1972}\left(\frac{100 + \text{New Growth Rate}}{100}\right)^{n}$$

Swine_{1972} = 374 million baht

Now growth rate is assumed to be a function of the per capita income growth rate, 3.6%. Institutional changes will decrease the price of pork to the consumer without lowering the price to the farmer and an elasticity of 1.72 was assumed giving a growth rate of 6.2%.

$$\text{Swine}_{n} = 374\ \left(\frac{100 + 6.2}{100}\right)^{n}$$

Other relationships:

(1) World demand

(2) Increasing productivity

Line Item 24: HENS and DUCKS

Quantitative Correlations

$$\text{Hens and Ducks}_n = \text{Hens and Ducks}_1 \left(\frac{100 + \text{Historic Growth Rate}}{100}\right)^n$$

$$\text{Hens and Ducks}_1 = \text{Hens and Ducks}_{1969} = 353 \text{ million baht}$$

Historic growth rate = 3.3%

$$\text{Hens and Ducks}_n = 353 \left(\frac{100 + 3.3}{100}\right)^n$$

Other relationships:

(1) Regional population

Line Item 25: EGGS

Quantitative Correlations

$$\text{Eggs}_n = \text{Eggs}_1 \left(\frac{100 + \text{Current Growth Rate}}{100}\right)^n$$

$$\text{Eggs}_1 = \text{Eggs}_{1969} = 236 \text{ million baht}$$

Current Growth Rate = 3.5%

$$\text{Eggs}_n = 236 \left(\frac{100 + 3.6}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 26 & 27: OTHER LIVESTOCK

Quantitative Correlations

$$\text{Other Livestock}_n = \text{Other Livestock}_1 \left(\frac{100 + \text{Historic Growth Rate}}{100}\right)^n$$

Historic Growth Rate = 4.9%

$$\text{Other Livestock}_1 = \text{Other Livestock}_{1969} = 13 \text{ million baht}$$

$$\text{Other Livestock}_n = 13\left(\frac{100 + 4.9}{100}\right)^n \text{ million baht}$$

Line Item 28: TOTAL LIVESTOCK

Quantitative Correlations

$$\text{Livestock}_n = \sum \text{Line Items 21 to 27}$$

Other relationships:

None

Line Items 30 & 31: FISH

Quantitative Correlations

$$\text{Fishing}_n = \text{Fishing}_1 \left(\frac{100 + \text{Current Growth Rate}}{100}\right)^n$$

$$\text{Fishing}_1 = \text{Fishing}_{1969} = 313 \text{ million baht}$$

Current Growth Rate = 5.2%

$$\text{Fishing}_n = 313 \left(\frac{100 + 5.2}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) Whole Kingdom fish production

(2) Regional demand

(3) Productivity

(4) Water availability

Line Items 32, 33 & 34: TIMBER

Quantitative Correlations

$$\text{Timber}_n = \text{Timber}_1 \left(\frac{100 + \text{New Growth Rate}}{100}\right)^n$$

$$\text{Timber}_1 = \text{Timber}_{1969} = 185 \text{ million baht}$$

New Growth rate is less than the historic because of institutional changes to enforce the curtailment of illegal cutting and is assumed to be 10%.

$$\text{Timber}_n = 185 \left(\frac{100 + 10}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) World demand

(2) National demand

(3) Regional demand

(4) Institutional changes

Line Item 35: CHARCOAL and FIREWOOD

Quantitative Correlations

$$\text{Charcoal and Firewood}_n = \text{Charcoal and Firewood}_1 = \text{Constant}$$

$$= 271 \text{ million baht}$$

Other relationships:

None

Line Item 36: OTHER FOREST PRODUCTS

Quantitative Correlations

$$\text{Other Forest Products}_n = \text{Other Products}_1 \left(\frac{100 + \text{Historic Growth Rate}}{100}\right)^n$$

$$\text{Other Forest Products}_1 = \text{Other Forest Products}_{1969} = 124 \text{ million baht}$$

$$\text{Historic Growth Rate} = 6\%$$

$$\text{Other Forest Products}_n = 124 \left(\frac{100 + 6.0}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 37: FORESTRY

Quantitative Correlations

$$\text{Forestry}_n = \Sigma \text{Line Items}_n \text{ 32 to 36}$$

Line Item 38: ALL AGRICULTURE

Quantitative Correlations

$$\text{All Agriculture}_n = \sum \text{Line Items } 1_n \text{ to } 18_n, + 21_n \text{ to } 27_n, + 32_n \text{ to } 36_n, + 30_n + 31_n;$$

$$= \sum \text{Line Items } 20_n + 28_n + 37_n + 30_n + 31_n;$$

Line Item 39: QUARRYING

Quantitative Correlations

$$\text{Quarrying}_n = \frac{15.9}{100} \text{ All Northeast Construction}_n$$

Other relationships:

(1) Regional public construction

(2) Regional private construction

(3) All regional construction

(4) Whole Kingdom quarrying production

(5) Regional demand

Line Item 40: PRIVATE CONSTRUCTION

Quantitative Correlations

$$\text{Private Construction}_n = \text{Private Construction}_1 \left(\frac{100 + 6.5}{100}\right)^n$$

$$\text{Private Construction}_1 = \text{Private Construction}_{1969} = 729 \text{ million baht}$$

$$\text{Private Construction}_n = 729 \left(\frac{100 + 6.5}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All manufactures

(2) All trade

(3) Ownership of dwellings

(4) Gross regional product

(5) Whole Kingdom private construction

(6) Regional urban population

(7) U.S. Bases

Line Item 41: PUBLIC CONSTRUCTION

Quantitative Correlations

$$\text{Public Construction}_n = \Sigma \text{Sector Programs}_n$$

Sector Programs are:-

Civil:

Education

Health

Roads

Lomsak - Chum pae highways

Dams and Irrigation:

Government buildings

Re offorestation

Urban development

Others

and Military:

Other relationships:

(1) All crops

(2) Gross regional product

(3) Whole Kingdom public construction

Line Item 42: ALL CONSTRUCTION

Quantitative Correlations

$$\text{All Construction}_n = \text{Public Construction}_n + \text{Private Construction}_n$$

Other relationships:

None

Line Item 43: SLAUGHTER HOUSES

Quantitative Correlations

Under review

Other relationships:

(1) Lattle production

(2) Buffalo production

(3) Swine production

(4) Gross regional product

(5) Regional population

(6) Product quality

Line Item 44: RICE MILLING

Quantitative Correlations

$$\text{Rice Mills (Northeast)}_n = \frac{16}{100} \text{ Paddy production (Northeast)}$$

$$= \frac{16}{100} \text{ Rice Mills(W.K)}_1 \left(\frac{100+\text{Paddy production growth rate}}{100}\right)^n$$

$$= \frac{16}{100} \cdot 582 \left(\frac{100 + 3.0}{100}\right)^n$$

The Rice Mills ratio of 16% is a compromise between the historic Paddy Production ratios for Northeast and the Whole Kingdom.

Other relationships:

(1) Paddy production

(2) Gross regional product

(3) Whole Kingdom rice milling

(4) National demand

(5) Productivity

Line Item 45: SUGAR MILLS

Quantitative Correlations

The ratio $\frac{\text{Sugar Milling Value Added}_n}{\text{Sugar Production Value Added}_n}$ has been gradually increasing historically.

The trend seems likely to continue in the Northeast

$$\frac{\text{Sugar Milling}_{1968}}{\text{Sugar Production}_{1968}} = \frac{33}{100}$$

Ratio increases 1% per year

$$\frac{\text{Sugar Milling}_n}{\text{Sugar Production}_n} = \frac{33 + n}{100}$$

$$\therefore \text{Sugar Milling}_n = \frac{33 + n}{100} \text{ Sugar Production}_n$$

$$\text{Sugar Production}_n = \text{Constant} = 60 \text{ million baht}$$

$$\text{Sugar Milling}_n = \frac{33 + n}{100} \times 60 \text{ million baht}$$

Other relationships:

(1) Whole Kingdom Sugar Milling

(2) Product quality

Line Item 46: OTHER FOOD MANUFACTURES

Quantitative Correlations

$$\text{Other Food Manufactures}_n = \text{Other Food Manuf.}_1 \left(\frac{100 + \text{Popu. Grow.rate+1}}{100}\right)^n$$

$$\text{Other Food Manufactures} = \text{Other Food Manufactures}_{1969} = 64 \text{ mill. baht}$$

$$\text{Other Food Manufactures}_n = 64 \left(\frac{100 + 4.0}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 47: ALL FOOD MANUFACTURES

Quantitative Correlations

$$\text{All Food Manufactures}_n = \Sigma \text{Line Items } 43_n \text{ to } 46_n$$

Line Item 48: DISTELLERIES

Quantitative Correlations

$$\text{Distelleries}_n = \text{Existing factories}_n + \text{New factories}_n$$

$$\text{Existing factories}_n = \text{Existing factories}_1 \left(\frac{100+\text{current grow. rate}}{100}\right)^n$$

$$= 39 \left(\frac{100 + \text{zero}}{100}\right)^n$$

$$= 39 \text{ million baht}$$

Assume consumption growth rate is proportional to gross domestic product growth rate

$$\text{Regional consumption growth rate} = \text{National Consumption growth rate} \times \frac{\text{GRP Growth Rate}}{\text{GNP Growth Rate}}$$

$$= \frac{9 \times 5.8}{7.0}$$

$$= 7.6\%$$

Assume new factories will meet consumption demand

$$\text{Distelleries}_n = \text{N.E. Consump.}_1 \left(\frac{100+\text{Regional Cons. Grow. Rate}}{100}\right)^n$$

$$= 39 \left(\frac{100 + 7.6}{100}\right)^n$$

$$= \text{Existing factories}_n + \text{New factories}_n$$

$$= 39\left(\frac{107.6}{100}\right)^n = 39 + \text{New factories}_n$$

Other relationships:

None

Line Item 49: SOFT DRINKS MANUFACTURES

Quantitative Correlations

$$\text{Soft Drinks}_n = \text{Existing factories}_n = \text{New factories}_n$$

$$\text{Existing factories}_n = \text{Existing factories}_1\left(\frac{100 + \text{Current Grow. Rate}}{100}\right)^n$$

$$= 16\left(\frac{100 + 3.6}{100}\right)^n \text{ million baht}$$

Assumed - Demand at anytime is proportional to urban population$_1$

then demand in N.E. is

$$\frac{\text{N.E. Urban population}}{\text{National urban population}} = \frac{312,000}{3,273,000} = 9.5\%$$

$$\frac{\text{Production in N.E.}}{\text{Production in Whole Kingdom}} = 4.9\%$$

$\therefore$ Only half of soft drinks consumed in N.E. and produced in N.E.

1969 consumption in N.E. = 2 x 16.4 = 32.8 million baht

1969	1970	1971	1972	1973	1974	1975	1976	
32.8	36.1	49.7	43.7	48.1	52.9	58.2	64.0	Consumption projection @10% 36% growth
16.4	17.0	17.6	18.2	18.9	19.6	20.3	21.0	Production with existing factories
16.4	19.1	22.1	25.5	29.2	33.3	37.9	43.0	Excess from imports or new factories

Assume that plant with required capacity can be built by mid 1972:-

Assume its capacity is:-

1969	1970	1971	1972	1973	1974	1975	1976
			11.7	29.2	33.3	37.9	43.0

Then value added to N.E. is:-

1969	1970	1971	1972	1973	1974	1975	1976	
16	17	18	31	48	53	58	64	million baht

Other relationships:

None

Line Item 50: TOBACCO MANUFACTURES

Quantitative Correlations

Under review

Other relationships:

(1) Gross regional product

(2) Whole Kingdom tobacco production

(3) Regional population

(4) National demand

(5) Regional demand

(6) Thai institutional changes

(7) Product quatity

(8) Productivity

(9) Land

Line Item 51: WEARING APPAREL

Quantitative Correlations

$$\text{Wearing Apparel}_n = \text{Wearing Apparel}_1 \left(\frac{100 + \text{GRP Growth Rate}}{100}\right)^n$$

$$\text{Wearing Apparel}_1 = \text{Wearing Apparel}_{1969} = 84 \text{ million baht}$$

GRP Growth Rate (assumed) = 5.8%

$$\text{Wearing Apparel}_n = 84 \left(\frac{100 + 5.8}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 52: COTTON PROCESSING

Quantitative Correlations

$\frac{\text{Cotton Processing in N.E.}}{\text{Cotton Processing in Whole Kingdom}}$ to increase from 7% in 1969 to 15% in 1976.

Up to 1974

$$\text{N.E. Cotton Processing}_n = \text{N.E. Cotton Processing}_1 \left(\frac{100 + 7}{100}\right)^n$$

$$\text{N.E. Cotton Processing}_1 = \text{N.E. Cotton Processing}_{1969} = 64 \text{ million baht}$$

$$\text{N.E. Cotton Processing}_n = 64 \left(\frac{100 + 7}{100}\right)^n \text{million baht}$$

1974. Instal plant with capacity 100 million baht, to develop over two years.

1975. N.E. Cotton Processing $= 64 \left(\frac{100 + 7}{100}\right)^n + 50$ million baht

1976. N.E. Cotton Processing $= 64 \left(\frac{100 + 7}{100}\right)^n + 100$ million baht

Other relationships:

(1) Whole Kingdom cotton processing

(2) Product quality

Line Item 53: GUNNY BAG MANUFACTURE

Quantitative Correlations

1970

$$\text{Gunny Bags}_{1970} = \text{Gunny Bags}_{1969} \left(\frac{100 + \text{Current Growth Rate}}{100}\right).$$

$$\text{Gunny Bags}_{1970} = 106 \left(\frac{100 + 5}{100}\right) \text{ million baht}$$

1970 Instal plant with capacity of about 20 million baht

1971 Gunny Bags_{1970} (Assumed) = 139 million baht

1972 On-wards

$$\text{Gunny Bags}_{n} = \text{Gunny Bags}_{1971} \left(\frac{100 + \text{Current Growth Rate}}{100}\right)^{n}$$

$$= 139 \left(\frac{100 + 5}{100}\right) \text{ million baht}$$

Other relationships:

(1) Kenaf production

Line Item 54: SILK MANUFACTURE

Quantitative Correlations

$$\text{Silk}_{n} = \text{Silk}_{1} \left(\frac{100 + 9}{100}\right)^{n}$$

$$\text{Silk}_{1} = \text{Silk}_{1969} = 115 \text{ million baht}$$

$$\text{Silk}_{n} = 115 \left(\frac{100 + 9}{100}\right)^{n} \text{ million baht}$$

Other relationships:

(1) World demand

(2) National demand

(3) Regional demand

(4) Product quality

(5) Productivity

Line Item 55: MAT MAKING

Quantitative Correlations

$$Mats_n = Mats_1 \left(\frac{100 + \text{Historic Growth Rate}}{100}\right)^n$$

$$Mats_1 = Mats_{1969} = 41 \text{ million baht}$$

$$Mats_n = 41 \left(\frac{100 + 3.5}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 56: ALL TEXTILE MANUFACTURES

Quantitative Correlations

$$\text{All Textiles}_n = \left\{ \text{Line Items } 52_n \text{ to } 55_n \right.$$

Other relationships:

None

Line Item 57: WOOD MANUFACTURES

Quantitative Correlations

$$\text{Wood}_n = \text{Wood}_1 \left(\frac{100 + 8}{100}\right)^n \text{ million baht}$$

Growth rate of 8% is assumed, and is in line with the growth rate of 7.8% of the non-agricultural sectors as a whole.

$$\text{Wood}_n = \text{Wood}_{1969} = 197 \text{ million baht}$$

$$\text{Wood}_n = 197 \left(\frac{100 + 8}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All construction

(2) All manufactures

Line Item 58: FURNITURE

Quantitative Correlations

$$\text{Furniture}_n = \text{Furniture}_1 \left(\frac{100 + 10}{100}\right)^n \text{ million baht}$$

Rate of 10% is an elasticity 1.5 with private construction as determined by recent trends.

$$\text{Furniture}_1 = \text{Furniture}_{1969} = 21 \text{ million baht}$$

$$\text{Furniture}_n = 21 \left(\frac{100 + 10}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All manufactures

(2) Non-Agricultural sectors

Line Items 59, 60, 61, 62 and 63: OTHER (MACHINE SHOPS ETC.) MANUFACTURES

Quantitative Correlations

This is an aggregate, but in general its growth will have a one to one elasticity with trade in manufactures with which it is very closely allied.

$$\text{Other Manufactures}_n = \text{Other Manufactures}_1 \left(\frac{100+14}{100}\right)^n \text{ million baht}$$

$$\text{Other Manufactures}_1 = \text{Other Manufacture}_{1969} = 203 \text{ million baht}$$

$$\text{Other Manufactures}_n = 203 \left(\frac{100 + 14}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All construction

(2) Private transportation

(3) Trade in domestic manufactures

(4) Regional Urban population

Line Item 64: ALL MANUFACTURES

Quantitative Correlations

$$\text{All Manufactures}_n = \text{Line Items } 43_n \text{ to } 46_n,\ 48_n \text{ to } 55_n,\ 57_n - 63_n$$

Other relationships:

(1) Gross regional product

(2) Whole Kingdom manufactures

Line Items 65 & 66: ELECTRICITY and WATER SUPPLIES

Quantitative Correlations

$$\text{Elec.} + \text{Water}_n = \text{Elec.}_n + \text{Water}_n$$

$$\text{Water}_n = \text{Water}_1 \left(\frac{100 + \text{Planned Growth Rate}}{100}\right)^n$$

$$\text{Water}_1 = \text{Water}_{1969} = 23 \text{ million baht}$$

$$\text{Planned Growth Rate} = 30\% \text{ per annum}$$

$$\text{Water}_n = 23 \left(\frac{100 + 30}{100}\right)^n \text{ million baht}$$

Electricity 1969 and 1971

$$\text{Elec.}_n = \text{Elec}_1 \left(\frac{100 + 10}{100}\right)^n$$

$$\text{Elec}_1 = \text{Elec}_{1969} = 139 \text{ million baht}$$

Electricity 1972 - 1976

$$\text{Elec.}_n = \text{Elec.}_{1971} \times \text{Increased Regional capicity due to Lam Dom Noi}_n$$

$$\text{Elec.}_{1971} = 168 \text{ million baht}$$

Lam Dom Noi will increase capacity from 80 Mega Watts by the following amounts:-

1972 $\frac{92}{80}$

1973 $\frac{98}{80}$

1974 $\frac{104}{80}$

1975 $\frac{110}{80}$

1976 $\frac{116}{80}$

1969 - 1971

$$\text{Elec + Water}_n = 139 \left(\frac{100 + 10}{100}\right)^n + 23 \left(\frac{100 + 30}{100}\right)^n \text{ million baht}$$

1972

$$\text{Elec + Water} = 168 \cdot \frac{92}{80} + 23 \left(\frac{100 + 30}{100}\right)^n \text{ million baht}$$

1973

$$\text{Elec + Water} = 168 \cdot \frac{98}{80} + 23 \left(\frac{100 + 30}{100}\right)^n \text{ million baht}$$

1974

$$\text{Elec + Water} = 168 \cdot \frac{104}{80} + 23 \left(\frac{100 + 30}{100}\right)^n \text{ million baht}$$

1975

$$\text{Elec + Water} = 168 \cdot \frac{110}{80} + 23 \left(\frac{100 + 30}{100}\right)^{n} \text{ million baht}$$

1976

$$\text{Elec + Water} = 168 \cdot \frac{116}{80} + 23 \left(\frac{100 + 30}{100}\right)^{n} \text{ million baht}$$

Other relationships:

(1) All manufacturing

(2) Gross regional product

(3) Whole Kingdom production

(4) Regional population

(5) Regional urban population

(6) National demand

(7) Regional demand

(8) U.S. Bases

(9) Product price

(10) Product quality

Line Item 67: TRANSPORTATION (PRIVATE)

Quantitative Correlation

$$\text{Transport (Private)}_{n} = \text{Transport (Private)}_{1} \left(\frac{100 + \text{Curr. Grow.Rate}}{100}\right)^{n}$$

$$\text{Transport (Private)}_1 = \text{Transport(Private)}_{1968} = 658 \text{ million baht}$$

Current Growth Rate = 12%

$$\text{Transport (Private)}_n = 658 \left(\frac{100 + 12}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All crops

(2) All livestock

(3) Forestry

(4) Quarrying

(5) Public transportation

(6) Trade

(7) Services

(8) Gross regional product

(9) U.S. Bases

(10) Thai institutional charges

Line Items 68 and 69: TRANSPORTATION (PUBLIC)

Quantitative Correlations

$$\text{Transportation(Public)}_n = \text{Public Road Trans.}_n + \text{Public Rail Trans.}_n$$

1970 Completion Korat = Ubon road

1970-1972

$$\text{Public Transport}_n = \text{Public Transport}_1 \left(\frac{100 - 5}{100}\right)^n \text{ million baht}$$

$$\text{Public Transport}_1 = \text{Public Transport}_{1970} = 105 \text{ million baht(assumed)}$$

Growth rate = -5% assumed

1973-1976

$$\text{Public Transport}_n = \text{Public Transport}_1 \left(\frac{100 + 5}{100}\right)^n \text{ million baht}$$

$$\text{Public Transport}_1 = \text{Public Transport}_{1972} = 95 \text{ million baht}$$

Growth Rate = 5% (assumed)

$$\text{Public Transport}_n = 95 \left(\frac{100 + 5}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) Trade

(2) Gross regional product

(3) U.S. Bases

(4) Thai institutional charges

Line Item 70: COMMUNICATIONS

Quantitative Correlations

$$\text{Communications}_n = \text{Communications}_1 \left(\frac{100+1.3 \times \text{Grow.Rate of Trade + Services}}{100}\right)^n$$

$$\text{Communications}_1 = \text{Communications}_{1968} = 39 \text{ million baht}$$

Growth Rate of Trade + Services = 7.7%

$$\text{Communications}_n = 39 \left(\frac{100 + 10}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All non-agricultural sectors

(2) Gross regional product

Line Item 71: TRADE OF IMPORTS - INTERMEDIATE GOODS

Quantitative Correlations

$$\text{Intermediate}_n = \text{Intermediate}_1 \left(\frac{100 + \text{Manufactures Growth Rate}}{100}\right)^n$$

$$\text{Intermediate}_n = \text{Intermediate}_{1969} = 44 \text{ million baht}$$

Manufacturing Growth Rate = 10.3%

$$\text{Intermediate}_n = 44 \left(\frac{100 + 10.3}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) Non agricultural manufactures

(2) All manufactures

Line Item 72: TRADE OF IMPORTS - CAPITAL GOODS

Quantitative Correlations

$$\text{Capital Goods}_n = \text{Capital Goods}_1 \times \left(\frac{100 + \text{Construction Growth Rate} + \frac{1}{2}\text{ Manu. Growth Rate}}{100}\right)^n$$

$$\text{Capital Goods}_1 = \text{Capital Goods}_{1969} = 543 \text{ million baht}$$

Construction Growth Rate = 0%

Manufacturing Growth Rate = 10.1%

$$\text{Capital Goods}_n = 543 \left(\frac{100 + 5}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All construction

(2) All manufacturing

Line Item 73: TRADE OF IMPORTS - CONSUMER GOODS

Quantitative Correlations

1969-1974

$$\text{Consumer Goods}_n = \text{Consumer Goods}_1 \left(\frac{100 + 2 \times \text{Per Capita Income Grow. Rate}}{100}\right)^n$$

$$\text{Consumer Goods}_1 = \text{Consumer Goods}_{1969} = 753 \text{ million baht}$$

Per capita income growth rate = 3.05 (assumed)

$$\text{Consumer Goods}_n = 753 \left(\frac{100 + 6.1}{100}\right)^n \text{ million baht}$$

1975 - 1976

$$\text{Consumer Goods}_n = \text{Cons. Goods}_1 \left(\frac{100+1.8 \times \text{Capita Income Grow. Rate}}{100}\right)^n$$

$$\text{Consumer Goods}_1 = \text{Consumer Goods}_{1974} = 1039 \text{ million baht}$$

Per capita growth rate = 3.1% (assumed)

$$\text{Consumer Goods}_n = 1039 \left(\frac{100 + 5.6}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All manufacturing

(2) Gross regional product

(3) Regional population

(4) Regional urban population

(5) U.S. Bases

(6) Product price

Line Item 74: TRADE IN DOMESTIC AGRICULTURE

Quantitative Correlations:

$$\text{Agriculture Trade}_n = \text{Relative Trade Margin} \times \text{Agri. Trade}_1 \times \left(\frac{100 + 2 \times \text{Agriculture Production Growth Rate}}{100}\right)^n$$

Relative Trade Margin is a serves between 1970 & 1976, 0.97, 0.97, 0.95, 0.94, 0.93, 0.92, 0.91, 0.90.

$$\text{Agriculture Trade}_1 = \text{Agriculture Trade}_{1969} = 626 \text{ million baht}$$

Agriculture Production Growth Rate = 3.75%

$$\text{Agricultural Trade}_n = \text{Trade Margin}_n \times 626 \left(\frac{100+7.5}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) All crops

(2) All livestocks

(3) Fishing

(Cont. page 38)

(4) Forest

(5) Sloughtering

(6) Rice milling

(7) Sugar milling

(8) Cotton manufacturing

(9) All manufacturing

(10) Thai Institutional changes

(11) Productivity

Line Item 75: TRADE OF DOMESTIC MANUFACTURING & MINING

Quantitative Correlations

Under review

Line Item 76: ALL TRADE

Quantitative Correlations

$$\text{All Trade}_n = \sum \text{Line Items } 71_n \text{ to } 75_n$$

Line Item 77: BANKING

Quantitative Correlations

$$\text{Banking}_n = \text{Banking}_1 \left(\frac{100 + 1.6 \times \frac{\text{Trade Growth Rate} + \text{Services Growth Rate}}{2}}{100} \right)^n$$

Banking_1 = Bangking 1969 = 104 million baht

$$1.6 \times \frac{\text{Trade Growth Rate} + \text{Services Growth Rate}}{2} = 11\%$$

$$\text{Bangking}_n = 104 \left(\frac{100 + 11}{100} \right)^n \text{ million baht}$$

Other relationships:

(1) All agriculture

(2) All manufactures

(3) All trade

(4) Whole Kingdom banking

(5) U.S. Bases

Line Item 78: INSURANCE & REAL ESTATE

Quantitative Correlations

$$\text{Insurance}_n = \text{Insurance}_1 \left(\frac{100 + 2.1 \times \frac{\text{Trade Grow. Rate} + \text{Ser. Grow. Rate}}{2}}{100} \right)^n$$

Insurance_1 = Insurance 1969 = 58 million baht

$$2.1 \times \frac{\text{Trade growth rate} + \text{Services growth rate}}{2} = 14.8\%$$

$$\text{Insurance}_n = 58 \left(\frac{100 + 14.8}{100} \right)^n \text{ million baht}$$

Other relationships:

(1) All manufactures

(2) All trade

(3) All services

(4) Whole Kingdom insurance

(5) Regional urban population

Line Item 79: EDUCATION

Quantitative Correlations

$$\text{Education}_n = \text{Education}_1 \left(\frac{100+\text{Teacher Train. Rate}-\text{Attrition Rate}}{100}\right)^n$$

$$\text{Education}_1 = \text{Education}_{1971} = 788 \text{ million baht (assumed)}$$

Education_{1971} is assumed on the basis of current trends

Teacher Training Rate per year = Approx. 10%

Attrition Rate = 7%

$$\text{Education}_n = 788 \left(\frac{100 + 3}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) Whole Kingdom education

(2) Regional population

(3) Regional urban population

(4) Regional rural population

(5) Service price

(6) Training productivity

(7) Training quality

Line Item 80: MEDICAL AND HEALTH

Quantitative Correlations

$$\text{Medical and Health}_n = \text{Medical and Health}_1 \left(\frac{100 + \text{Historic Growth Rate}}{100}\right)^n$$

$$\text{Medical and Health}_1 = \text{Medical and Health}_{1969} = 167 \text{ million baht}$$

Historic Growth Rate = 9.5%

$$\text{Medical and Health}_n = 167 \left(\frac{100 + 9.5}{100}\right)^n \text{ million baht}$$

Other relationships:

(1) Whole Kingdom medical and health services

(2) Regional population

(3) Regional urban population

(4) Regional rural population

(5) Training productivity

(6) Service quality

Line Items 81 & 88: RECREATION AND HOTELS ETC.

Quantitative Correlations

$$\text{Recreation and Hotels}_n = \text{Recreation}_n + \text{Hotels}_n$$

Historically:

2.6 x Recreation and Entertainment = Hotels + Restaurant

This ratio will be presumed to continue.

$$\text{Recreation and Hotels}_n = \text{U.S. Bases}_n + \text{Local}_n$$

U.S. Bases_n = Expenditure from U.S. Base personel

Local_n = Expenditure from Normal local conditions

U.S. Bases_n is considered to be at a maximum and constant for plan period. The above was derived as follows and had a value of 124 million baht:- Between 1960 and 1964 Recreation + Hotels had a growth rate of 10% (that is 1.6 x GRP growth rate) and by 1964 had reached 274 million baht. Assuming this growth rate continued to 1969 the value added would have been 441 million baht. Because of the introduction of the U.S. bases the growth rate increased to 16% and the value added reached 565 million baht. The difference 124 million baht is assumed to be due to U.S. Base Personel spending.

U.S. Bases_n = Constant = 124 million baht

$\text{Local}_n = \text{Local}_{1969} = 441$ million baht

GRP Growth Rate = 6.2%

$$\text{Local}_n = 441 \left(\frac{100 + 9.92}{100}\right)^n \text{ million baht}$$

$$\text{Recreation and Hotels}_n = 441 \left(\frac{100 + 9.92}{100}\right)^n + 124 \text{ million baht}$$

$$\text{Recreation}_n = \frac{1}{2.6} \times 441 \left(\frac{100 + 9.92}{100}\right)^n + 124 \text{ million baht}$$

$$\text{Hotels}_n = \frac{1.6}{2.6} \times 441 \left(\frac{100 + 9.92}{100}\right)^n + 124 \text{ million baht}$$

(Con't page 43)

Other relationships:

(1) Gross regional product

(2) Regional demand

(3) U.S. Bases

Line Item 82: DOMESTICS

Quantitative Correlations

$$\text{Domestics}_n = \text{Domestics}_1 \left(\frac{100 + \text{Gross Regional Product Growth Rate}}{100}\right)^n$$

$$\text{Domestics}_1 = \text{Domestics}_{1969} = 83 \text{ million baht}$$

Gross regional product growth rate = 6.2% (assumed)

$$\text{Domestics}_n = 83 \left(\frac{100 + 6.2}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 84: LAUNDRIES, BARBER SHOPS ETC.

Quantitative Correlations

$$\text{Laundries}_n = \text{Laundries}_1 \left(\frac{100 + \text{All Services Growth Rate}}{100}\right)^n$$

$$\text{Laundries}_1 = \text{Laundries}_{1969} = 100 \text{ million baht}$$

All Services growth rate = 7% (assumed)

$$\text{Laundries, Barber shops, etc.} = 100 \left(\frac{100 + 7}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 85: RELIGIONS ORGANIZATIONS, WELFARE INSTITUTES, ETC. (CHAIRITIES)

Quantitative Correlations

$$\text{Charities}_n = \text{Charities}_1 \left(\frac{100 + \text{GRP Growth Rate}}{100}\right)^n \text{ million baht}$$

$$\text{Charities}_1 = \text{Charities}_{1969} = 361 \text{ million baht}$$

GRP Growth Rate = 6.2% (assumed)

$$\text{Charities}_n = 361 \left(\frac{100 + 6.2}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 86: ALL SERVICES

Quantitative Correlations

$$\text{All Services}_n = \sum \text{Line Items } 79_n \text{ to } 85_n$$

Line Item 87: OWNERSHIP OF DWELLINGS

Quantitative Correlations

$$\text{Dwellings}_n = \text{Dwellings}_1 \left(\frac{100 + \text{Growth Rate}}{100}\right)^n \text{ million baht}$$

$$\text{Dwellings}_1 = \text{Dwellings}_{1969} = 312 \text{ million baht}$$

$$\text{Growth Rate (assumed)} = \frac{\text{Historic National} + \text{Historic Regional}}{2}$$

$$= 4.8\%$$

$$\text{Dwellings}_n = 312 \left(\frac{100 + 4.8}{100}\right)^n \text{ million baht}$$

Other relationships:

None

Line Item 88: PUBLIC ADMINISTRATION & DEFENCE

Quantitative Correlations

Being revised

Line Item 89: NON - AGRICULTURAL SECTORS

Quantitative Correlations

$$\text{Non-- Agricultural Sectors}_n = 39_n \text{ to } 41_n,\ 43_n \text{ to } 46_n,\ 48_n \text{ to } 55_n,\ 57_n \text{ to } 63_n,\ 65_n \text{ to } 75_n,\ 77_n \text{ to } 65_n,\ 87_n,\ 88_n.$$

Line Item 90: GROSS REGIONAL PRODUCT

Quantitative Correlations

$$G.R.P._n = \sum 38_n,\ 89_n.$$

APPENDIX B

NEED Stage 3 Planning Report

MARKETING: DEMAND AND DISTRIBUTION CONDITIONS IN NORTHEAST THAILAND

MARKETING APPENDIX B

TABLE OF CONTENTS

MARKETING APPENDIX

Summary:

The results of the marketing study identified several products for which there is potential demand.

The potential demand is significant and if exploited could result in having an impact on the Northeast and other regions which produce the products in demand.

This appendix serves (a) to identify general product areas for which there is demand and (b) as the beginning of a necessary marketing data base. More specific studies concentrating on the products for which there is demand are being developed.

The eleven product groups analyzed in the Marketing Appendix are:

1. Livestock-cattle, poultry, swine (in various forms)
2. Rice
3. Maize
4. Soybeans
5. Oilseed cake, meal, and oil
6. Cotton and cottonseed
7. Tobacco
8. Kenaf
9. Silk
10. Vegetables
11. Timber

The three major sources of potential future demand are the Northeast regional market, the national market of Thailand, and the international market - in particular the Far East regional market.

The products for which there appears to be potential demand (according to source of demand) are:

1. Northeast regional market:

   a. vegetables - regional import substitution.

   b. livestock - assuming a more rational marketing structure and the development of processing industries within the Northeast.

   c. tobacco and cotton - assuming the development of processing industries.

2. Thailand national market:

   a. cotton - import substitution

   b. tobacco - import substitution

   c. vegetable oil - import substitution

   d. meat products

3. International market (Far East Region):

   a. Bovine meat;

   b. Swine meat;

   c. poultry

   d. Unmilled maize

   e. Soybean cake

   f. Soybeans (raw)

   g. Cottonseed

   h. Raw cotton

   i. Soybean oil

   j. Timber

The total value of the Far East regional deficit for the above products (excluding timber) was over $1.3 billion in 1967. The limiting factors for Thailand for the above products are production constraints, quality problems, and special trading agreements or arrangements now in existence.

DISTRIBUTION SYSTEM: Products flow out of the Northeast through several

different systems. The merchant system handles at least 90 percent of the crop commodities out of the region. Almost all livestock moves through a livestock - buyer wholesale system.

There are some distortions within the existing systems which adversely affect producers and consumers. However, the existing systems are capable of handling the product flow. Reform should be aimed at improving the present system rather than trying to replace it completely.

Potential demand does exist for some products which the Northeast has historically produced to some extent. Whether or not the Northeast will be able to meet this demand will depend upon its ability to produce the quality product necessary.

MARKETING APPENDIX

I. Introduction:

Planning, if it is to be effective and useful, requires the development of realistic targets and programs. Targets which are chosen at random with little relationship to "real world" situations hinder rather than assist the planning process.

The purpose of the following Marketing Appendix was to develop information which would be useful in the establishment of targets for the Agricultural Sector for the Northeast Third Five Year Plan. By determining market potential for Northeast products, it was possible to assign priorities to those products for which there was potential demand. The basic rational for this approach was that it is pointless to concentrate development efforts on products for which there is a limited market. This is a waste of development resources and leads to producer frustration.

After products with market potential were selected, analysis was made of regional productive capabilities and the inputs necessary to achieve satisfactory production. Upon completing this analysis, realistic targets could be set.

I.1 Procedure Followed:

In developing the Marketing Appendix, the initial step was to select the Northeastern products to be considered. This was followed by an analysis of regional, national, and international markets. Finally, the distribution system through which products move from the producer to the ultimate consumer was determined.

Note: The Marketing Appendix is a preliminary report based on preliminary studies. It is to serve as a base, but it is subject to change, correction, and updating. More market research work must be done, and it must continue

on a regular basis [illegible] because markets are always changing. One of the tasks of the Market Research Unit will be to keep data up to date.

Some of the information included in the appendix is applicable to more than the specific products mentioned or to more than the Northeast.

I.2 Products Considered:

Product selection for analysis was based on various factors. The three key factors were:-

(1) products which are presently produced in the Northeast;

(2) products for which there is some productive capacity in the Northeast; and

(3) products for which it appears there may be some demand.

Some processed agricultural products were included (especially when analyzing international demand) on the assumption that processing industries could be developed in the Northeast or the Northeast could supply raw material to factories elsewhere.

The product list is not all-inclusive but it does cover major items, particularly in terms of total Agricultural Sector value-added.

Those products analyzed are:-

(1) Livestock - cattle, poultry, hogs (in various forms)

(2) Rice

(3) Maize

(4) Soybeans

(5) Oilseed cake, meal, and oil

(6) Cotton and cottonseed

(7) Tobacco

(8) Kenaf

(9) Silk

(10) Vegetables

II. Regional Demand:

Economy:

The Northeast as a region is dominated by the agricultural sector which in 1968 accounted for 44.7 percent of the Gross Regional Product. Paddy is the dominant component of the Agricultural sector accounting for over 44 percent of the value added of the sector in 1968. With the exception of the wholesale and Retail Trade sector, no other sector accounted for more than 10 percent of total GRP in 1968.

Per capita GRP is lower in the Northeast than in any other region. For the period 1965 through 1968, per capita GRP was 1,322 baht, 1,517 baht, 1,382 baht and 1,476 baht. In 1966 when the Northeast per capita GRP was 1,517 baht, the Northern region per capita GRP was over 2,000 baht, the South roughly 3,000 baht and the Central region 4,500 baht.

II.1 Population:

The total population in the Northeast increased from 10,792,000 in 1965 to 11,798,000 in 1966. The Northeast contains roughly 1/3 of the national population. A population increase of roughly 3.2 percent per year is expected in the future.

Over 85 percent of the Northeast population is rural with a very small percentage of the total population employed full - time outside the agricultural sector.

II.2 Per Capita Consumption and Food Expenditures:

Tables 1 and 2 illustrate per capita food consumption in the Northeast and other regions and annual average per capita expenditures for various food and beverages. Rice is the staple in the diet of residents of the Northeast and the rural resident spends over 50 percent of his food budget on rice.

TABLE 1

Annual Per Capita Food Consumption in Kilograms

Food	Whole Kingdom	Central	Northeast	North	South
Rice - Cereals	168.6	159.7	185.2	182.2	155.1
Meat	11.2	11.0	8.1	13.2	10.6
Milk - eggs	.1	.1	-	-	-
Fish	9.3	11.3	8.8	3.9	9.1
Fats, Oils	1.0	1.7	.2	.8	1.5
Fruit, nuts	14.4	14.8	15.4	9.9	23.5
Vegetables	19.7	22.2	17.2	18.7	12.8
Sugar	2.4	448	.7	1.3	3.8
Other	3.1	1.8	3.4	3.2	5.5
Total	229.8	227.3	238.9	233.3	222.1

Source: Household Expenditure Survey of 1962 with weekly data computed on annual basis.

TABLE 2

Annual Average Per Capita Expenditures For Various Food and Beverage - in Baht

Urban Areas

Food	Whole Kingdom*	Central	Northeast	North	South	Urban Average
Rice - Cereals	255	197	280	205	218	224
Meat	109	172	204	165	202	186
Milk, eggs	23	49	40	33	48	44
Fish	74	108	99	58	139	105
Fats, oils	8	15	15	8	18	13
Fruit, nuts	27	48	40	40	82	52
Vegetables	48	78	83	71	95	82
Sugar	10	11	9	6	16	10
Other	118	295	217	161	300	255
Total	672	974	987	748	1,119	973

Rural Areas

Food	Central	Northeast	North	South	Rural Average
Rice - Cereals	274	265	233	267	259
Meat	96	57	100	88	54
Milk, eggs	30	5	12	26	16
Fish	83	51	36	93	63
Fats, oils	9	2	5	14	6
Fruit, nuts	29	12	15	41	21
Vegetables	55	31	26	51	39
Sugar	18	3	5	19	9
Other	86	30	37	139	61
Total	681	455	470	738	557

Source: Household Expenditure Survey, 1963.
National Statistical Office

* Includes Urban and Rural

The general picture which emerges of the Northeast is one of a subsistance economy. The bulk of the population has little or no surplus or extra purchasing power which would serve to increase demand and thus stimulate production of various products.

Given the present structure of the regional economy and the difficulty of effecting significant change in a short period of time, no changes in regional consumer income significant enough to cause large demand increases for the products under study are expected over the plan period.

There are, however, three agricultural production stimulii which could occur within the region which would not require increased consumer income. These are:-

(1) Regional import substitution - The Northeast is now a net importer of vegetables from other regions. (Vegetables from other regions also pass through the Northeast enroute to Laos) production of vegetables could be increased even with demand remaining constant if import substitution occurred. Preliminary studies show that Ubon is an area where this could occur as well as some of the central parts of the Northeast.

Further studies arennecessary to determine if import substitution could occur for other products.

(2) Demand increase through consumer price reduction - Preliminary studies in the Northeast indicate prices for some products, particularly meat product products (beef, pork, and chicken) are excessively high to the consumer and depressed to the producer. This is caused by distortions in the marketing structure - often at the slaughterhouse. A more rational marketing structure should result in lower consumer prices and higher producer prices which would stimulate increased consumption and production.

The exact distortions are difficult to determine for quite often various individuals - some cuite important - are involved.

To identify marketing distortions will require special studies of changwad markets by knowledgeable personnel and programs properly supported to eliminate the distortions. The initial changwad studies could be one of the functions of the Market Research Unit.

The question of distortions is quite serious since their existence neutralizes all attempts at productivity increases since the producer has no reason to increase productivity if he receives a low price for his product.

(3) Establishment of more manufacturing in the Northeast--

The establishment of more manufacturing in the Northeast would be for two reasons. These are:-

(a) Northeastern manufactured goods would replace those which are imported from other regions which utilize raw material from the Northeast or which the Northeast could produce. This is particularly true for cigarettes, cotton textiles, and animal feeds.

Northeastern raw material production would not necessarily increase for those processed goods which already utilize Northeastern raw material but are processed outside the Northeast unless the transport saving would reduce cost and thus stimulate more demand. Production increases would be stimulated if Northeastern raw materials could replace the raw materials from other regions.

The Northeastern raw material content of cigarettes, textiles, and animal feeds sold in the Northeast could be increased.

The establishment of a livestock processing plant in the Northeast would stimulate livestock production as well as associated input production of maize, soybean cake, and other feeds. The bulk of the demand for processed

meat would, however, be national and international.

The above discussion serves basically to identify rather than to quantify potential increased regional demand. In terms of total regional impact points (1) and (2) are probably not significant. However, in terms of local impact they could be very significant. Point (3) could result in a significant regional impact -- particularly the livestock. To quantify point (3) will require individual feasibility studies of the industries in question.

In spite of point (3) regional demand alone is not, and over the plan period will not be significant enough to stimulate large production increases. The demand stimulous will have to come on the national or international level.

In terms of individual products, the highest realistic demand growth rate which could be expected for any product would be a rate equal to the rate of growth of the population. There will be no major income changes which could result in a charge in consumer habits thus stimulating demand for certain items. Glutinous rice will continue to be the mainstay of the region with most consumed within the Northeast.

III. National Demand:

For this analysis a complete consumer analysis was not done. Some fairly detailed consumer information is available, especially for Bangkok-Thonburi, but in order to develop the information necessary for use in the five year plan, national demand information was developed in four ways. These are:-

(1) Income elasticities -- In order to determine the growth in national demand for products produced in the Northeast, information concerning income elasticities was gathered. Applying these elasticities to national income growth rates gave an indication of demand growth for some Northeast

products. Table 3 illustrates the income elasticities of Thailand for certain foods.

TABLE 3

Income Elasticities for Selected Foods in Thailand

Food	Elasticity
Rice	.2
Starchy roots	.1
Sugar	1.0
Vegetables	.2
Fruit	.6
Meat	1.0
Fish	.5
Fats & Oils	1.0

Source: FAO

These elasticities were one of the factors considered in setting targets in the Third Development Plan for the Northeast.

(2) Import Substitution:

Products imported by Thailand drain the country's reserves. Replacing these imports with Thai products would result in foreign exchange savings. However, the replacement product must be of equal quality to the import thus necessitating increased efforts by the productive sector as well as adequate technical and credit inputs.

Of the products being studied substantial import substitution potential exists for three. These are cotton, tobacco, and vegetable oil. The 1968 quantity and value of imports and exports of the three products are shown in Table 4.

TABLE 4

1968 Trade of Cotton, Tobacco & Vegetable Oils Whole Kingdom

Product	Imports		Exports		Trade Deficit	
	Metric Tons	Million Bahts	Metric Tons	Million Bahts	Metric Tons	Million Bahts
Tobacco	11,647	412	10,356	198	1,291	214
	Kilograms	Bahts	Kilograms	Bahts	Kilograms	Bahts
Cotton	22,737,627	230,389,976	3,793,938	7,124,465	18,943,689	223,265,511
	Liters	Bahts	Liters	Bahts	Liters	Bahts
Vegetable Oils	2,508,333	21,271,123	152,386	773,762	2,427,947	20,497,361

Source: Department of Customs

The largest value dificit is in cotton, closely followed by tobacco and finally vegetable oil, historically there has been a sizeable value deficit for each product. A more complete analysis of Northeastern cotton production and deficits as well as more complete historical trade data on tobacco and vegetable oil is contained in Annex 1 of this appendix.

Import substitution potential also exists for meat. Export figures are being developed;

(3) Demand generated by new industry. New processing industries or the expansion of existing facilities will generate demand for certain products -- both direct demand and indirect (supply for secondary industries).

This type of demand is of course related to national and international demand for the particular product. However, by analysis of the manufacturing sector and its future needs, it is possible to further refine future demand targets for raw materials.

This portion of the demand analysis will be done when the national targets for the manufacturing sector are established.

(4) Impact of the removal of some of the distortions in the livestock marketing system.

Initial analysis of the present livestock marketing and processing systems has shown that there are many flows and distortions within the system which adversely affect both producers and ultimate consumers.

A separate livestock study is now underway to determine what programs could be implemented to improve the situation and what the impact of those programs would be on production and consumption.

IV. International Demand:

An analysis of international demand requires more than a general survey of world markets and price trends. The analysis must try to identify potential "reachable" markets - those markets to which Thailand could realistically expect to sell given a sales and production effort on the part of Thailand.

For this preliminary analysis the international demand which seemed most relevant to Thailand was the demand of the Far Eastern region. The region is a natural trading area for Thailand. The assumption is that Thailand should seek first to fill those market gaps which are geographically the closest rather than aim at far distant markets where it would suffer from a geographic disadvantage.

To determine the Far Eastern market situation, a Far Eastern regional surplus - deficit analysis was carried out. The surplus - deficit study determined which Northeast products were imported into the Far Eastern region, which were exported, and which were in sufficient supply to satisfy regional demand. Those products which were imported into the region are believed to have the greatest potential for Thailand. Thailand, due to its geographic advantage, should be able to substitute its products for those being imported from outside the region. This, of course, assumes a comparable quality product.

This analysis identifies crops with potential market demand and the countries toward which trade should be directed. Average prices for the different products are also shown.

The analysis does not cover special trade situations such as relevant international commodity agreements, special country to country trade arrangements, regional trade agreements, quotas, special product subsidies, etc.

The size of the international market for certain Northeast products is quite substantial and in terms of the total Northeast, it could have a much greater impact than either the Northeast regional market demand or Thai national demand.

In the following text, Part IV.1 covers the Far Eastern regional surplus - deficit situation. Also included are more specific market studies on soybeans and cattle. The final section deals with timber. All back up figures and data are included in Annex 2.

Part IV.2 is a more general discussion of world-wide trends and conditions.

IV. 1. Market Gaps or Potential Markets for Northeast Products

A. Products Analyzed:

1. Live Bovine Cattle (inc. Buffaloes)
2. Live Swine
3. Meat of Bovine Animals - Fresh, chilled, frozen
4. Meat of Swine - Fresh, Chilled, Frozen
5. Poultry - Killed or Dressed, Fresh, Chilled or Frozen
6. Canned Meat
7. Rice
8. Unmilled Maize
9. All Oilseed Cake and Meal
10. Soybean Cake and Meal
11. Cottonseed Cake and Meal
12. Tobacco, Unmanufactured
13. Soybeans
14. Cottonseed
15. Silk
16. Raw Cotton
17. Cottonseed Oil
18. Soybean Oil

B. Initial Analysis:

1. Interregional and intraregional trade flows throughout world were studied.
2. The Far East was broken out. Particular attention was paid to the "natural" trade area for Thailand. Countries within this area could buy or could compete with Thai products.

3. In the Thai "natural" trade area, trade data was analyzed to determine

(a) in which products the area is self-sufficient (i.e. area member countries which, through intraregional trade, are self-sufficient), (b) which products the region must import, and (c) which products the area exports.

4. In terms of markets, the best potential market is for products which must now be imported from outside the region, the second best is for getting a larger share of market for those products in which the region is now self-sufficient; and the worst potential market is for those products which are in surplus and are exported out of the region.

The assumption here is that for trading purposes Thailands' best opportunities lie first within the Far Eastern region due to transport advantages, regional trade and political agreements, to historic ties, and to special relationships which have developed among countries.

Trade outside the region is certainly possible, but unless Thailand has a unique product, the competition from other areas (some of them probably having geographic advantage) will be very strong.

The point is that Thailand should concentrate first on supplying products for which there is now a deficit in the Far East region. The only exception to this could be silk which is a unique product.

C. Product Analysis: The results of the regional surplus study per product are shown below.

1. Live Bovine Cattle (inc. buffalo) Regional surplus exists

2. Live Swine:

Regional surplus exists

3. Bovine Meat - Fresh, Chilled, Frozen

Regional deficit exists

4. Swine Meat - Fresh, Chilled, Frozen

Regional deficit exists

5. Poultry

Regional deficit exists

6. Canned Meat

Regional surplus exists

7. Rice

Through 1966 there was a regional surplus, in 1967 there was deficit. Surplus situation appears to be occurring again.

8. Unmilled Maize

Regional deficit exists

9. All oilseed cake and meal

Regional surplus

10. Soybean Cake

Regional deficit

11. Cottonseed Cake

Regional surplus

12. Tobacco

Regional surplus

13. Soybeans

Regional deficit

14. Cottonseed

Regional deficit

15. Silk

Regional surplus

16. Raw Cotton

Regional deficit

17. Cottonseed Oil

Regional surplus

18. Soybean Oil

Regional deficit

In summary, those products for which there is a regional deficit are:

(a) Bovine meat, fresh, chilled, frozen

(b) Swine meat, " " "

(c) Poultry " " "

(d) Unmilled maize

(e) Soybean cake

(f) Soybeans

(g) Cottonseed

(h) Raw Cotton

(i) Soybean Oil

Production efforts should be concentrated on those products yielding the highest return. In terms of earnings potential, the following results were obtained:

(a) Bovine meat - fresh, chilled, frozen

From 1962 through 1967 there was a fairly steady growth in the size of the deficit. From 1962 through 1966 the deficit grew from 11,053 tons with a value of $6,590,000 to 23,035 tons with a value of $19,666,000. Total quantity in 1967 dropped to 20,241 tons but value increased to $19,878,000.

The average value per ton of beef imports to Asia has increased yearly from $610 in 1962 to $990 in 1967.

Largest Importers: (1967)

(a) Japan 64% of total quantity

(b) Singapore 19%

(c) Hong Kong 12%

(d) Malaysia 5%

Thai Price: FAO data shows the export price per ton of Thai beef has

varied from $333 to $1,000.

Thai Share of Market: Thailand's market share of Asian exports has not been greater than 1 percent.

Apparent Present Source (Competition);

Australia and New Zealand at present run large trade surpluses. To get a share of market Thailand will have to compete with them.

(b) Swine meat - fresh, chilled, frozen

From 1962 to 1963 the regional deficit jumped from 4,836 metric tons (value = $2,524,000) to 11464 tons (value = $7,830,000). In 1967 the total deficit was 16,445 tons valued at $8,023,000.

The average value per ton of Asian swine meat imports from 1962 through 1967 was $520, $685, $640, $510, $505, and $495.

Largest importers: (1967)

(i) Hong Kong 90 percent of total quantity

(ii) Singapore 5 percent

(iii) Malaysia 1 percent

Thai Price: The Thai export price per ton has varied from $1,000 to $500.

Thai Share of Market: In 1965 Thailand accounted for 4 percent of total Asian exports. In 1967 it was 1 percent.

Apparent Present Source of Supply (Competition):

Export surplus areas are North and Central America and South America.

(c) Poultry Meat:

From 1962 through 1967 the regional deficit grew steadily from 6737 metric tons valued at $4,050,000 to 24,326 metric tons valued at $14,233,000.

The average value per ton of imports has varied from $589 to $653 with the price in 1967 being $592.

Largest importers: (1967)

(i) Hong Kong 53 percent of total quantity

(ii) Japan 33 percent

(iii) Singapore 12 percent

Thai price: The Thai export price per ton appears to be around $400 to $500.

Thai Share of Market: Thailand accounts for around 0 percent of Asian exports.

Apparent Present Source of Supply:

Europe and North and Central America are not exporters.

(d) Unmilled Maize:

The regional deficit in 1962 was 2,615,400 metric tons valued at $156,640,000. This dropped in 1963 but by 1967 the deficit had grown to 3,282,300 metric tons valued at $233,900,000.

The average value per ton of imports varied from $59 in 1962 to $68 in 1967.

Largest importers: (1967)

(i) Japan roughly 90% of total quantity

(ii) China mainland 3 percent

(iii) China Taiwan 3 percent

(iv) Hong Kong 2 percent

Thai Price: The average price per ton of Thai exports has grown fr... $51 in 1962 to $60 in 1966 and 1967.

Thai Share of Market: Thailand has accounted for well over 50% of Asian exports and in 1967 it accounted for 93%. In terms of total Asian demand Thailand provided roughly 25% of the total amount necessary to meet demand.

Apparent Present Source of Supply:

North and Central America, South America, and Africa are all net exporters. North America supplies most corn to Asia.

(c) Soybean Cake

The regional deficit figure has been quite erratic varying from a deficit of 50,160 metric tons valued at $5,016,000 in 1965 to 1500 tons valued at $245,000 in 1963. The deficit in 1967 was 31,490 tons valued at $3,192,000.

Average value per ton of Asian imports ranged from $89 in 1962 to $109 in 1966. 1967 price was $102.

Largest Importers: (1967)

(i) Philippines (roughly 92% in 1967)

(ii) Japan - formerly a large importer but now declining in imports.

Thai Price: The average price per ton of Thai exports ranged from $74 in 1964 to $89 in 1967.

Thai Share of Market: Thailand has accounted for a large portion of Asian exports ranging from 100% in 1964 to 46% in 1967. In 1967 Thai exports accounted for less than 7% of total Asian demand.

Apparent Present Source of Supply: North America accounts for the bulk of world exports.

(f) Soybeans:

Regional deficit has increased steadily from 1,070,390 tons valued at $102,298,000 to 2,015,180 metric tons valued at $250,628,000 in 1967.

Average value per ton of Asian imports grew from $103 in 1962 to $125 to 1967.

Largest Importers: (1967)

(i) Japan (roughly 83%)

(ii) Taiwan (roughly 15%)

Thai Price: The average price of Thai exports bottomed at $104 per ton in 1964, rose to $135 in 1965 and dropped to $123 in 1967. Thai Share of Market: Thailand through 1967 accounted for roughly 1% of total Asian exports. The large exporter was mainland China. In terms of meeting total Asian demand, Thailand's exports have been negligible.

Apparent Present Source of Supply: North America is the major world supplier of soybeans.

(g) Cottonseed:

Regional deficit grew from 145,190 tons in 1962 valued at $11,009,000 to 245,596 tons valued at $22,493 in 1966 and then fell to 186,756 tons valued at $17,684,000 in 1967.

Average value per ton of Asian imports increased from $70 in 1962 to $91 in 1967.

Largest Importers: (1967)

(i) Japan - roughly 99%

(ii) Pakistan

(iii) Hong Kong

Thai Price: The average price of Thai exports grew from $42 in 1962 to $69 in 1967.

Thai Share of Market: In 1967 Thailand accounted for 97% of total Asian exports of cottonseed. Thai exports, however, satisfied less than 14 percent of total Asian demand.

Apparent Present Source of Supply:

North and Central America as well as Africa are net exporters.

(h) Raw Cotton:

Regional deficit grew steadily from 951,330 metric tons valued at $619,620,000 in 1962 to 1,206,090 metric tons valued at $734,340,000 in 1967.

Average value per ton of Asian imports fell from $630 in 1962 to $587 in 1967.

Largest Importers: (1967)

(i) Japan 54% of total quantity

(ii) Hong Kong 10 percent

(iii) Taiwan 6 percent

(iv) Philippines 2 percent.

Thailand throughout 1967 was a net importer.

Present Source of Supply: Net exporters are North and Central America, Africa, South America and the USSR.

(i) Soybean Oil:

Regional deficit grew from 87,883 tons valued at $29,031,000 in 1962 to 144,483 valued at $38,778,000 in 1964 then fell below 100,000 tons 1966 and then rose to 116,053 tons valued at $41,705,000 in 1967.

Average value per ton of Asian imports declined from $326 in 1962 to $268 in 1964 and then grew to $355 in 1967.

Largest Importers: (1967)

(i) India 41 percent of total quantity

(ii) Pakistan 28 percent

(iii) South Vietnam 12 percent

(iv) Burma 11 percent.

Thailand through 1967 was a net importer.

Present Source of Supply: North American provided all exports.

(j) Silk:

There is not a silk deficit in Asia but it is a unique product and one which has world-wide demand but limited supply. Thailand enjoys having silk technology but in terms of exports Thailand has not exploited its skills.

Total 1967 world imports were 15,036 tons of which roughly 1/3 were Asian imports.

In 1967 Asia imported 5020 tons valued at $39,530,000 or $7,874 per ton.

Asian exports were 8735 tons valued at $54,216,000 in 1967.

Major importers:

(i) Italy } Roughly 2/3
(ii) Japan }

(iii) USA

(iv) West Germany

(v) France

(vi) Switzerland

Thailand participation in the silk market has been almost zero.

Table 5 summarizes the 1967 quantity and value deficit in the Far Eastern region for those Northeast products which are in deficit in the region. The table also includes a brief summary on price and volume trends.

Table 6 gives the complete year by year surplus & deficit (quantity and value) for each product.

TABLE 5

Summary of Far Eastern Deficit Products and Trends *

Product	1967 Deficit	Value of Deficit	Value per Unit of Import	1962-1967 Trend
Bovine Meat	20,241 tons	$ 19,878,000	$990	Steady increase in volume of deficit and increase in value per ton
Swine Meat	16,445 tons	8,023,000	$495	Volume increase but per unit price erratic and downward
Poultry Meat	24,320 tons	14,233,000	$592	steady volume increase but value per unit declining
Maize	3,282,300 tons	233,900,000	$68	steady increase in volume and unit value
Soybean Cake	31,490 tons	3,192,000	$102	erratic volume movement and price per unit movement
Soybeans	2,015,180 tons	250,628,000	$125	steady increase in volume and price per unit
Cottonseed	186,756 tons	17,684,000	$91	steady volume increase until sudden drop in 1967-steady price per unit increase
Raw Cotton	1,206,090 tons	734,340,000	$587	volume generally rose but price per unit declined
Soybean Oil	116,053 tons	41,705,000	$355	erratic but increasing in volume with fairly steady growth in value per unit
Total	6,898,881 tons	1,323,583,000		

* Products found in Northeast Thailand

Source: FAO and NEED PAG calculations

TABLE 6

Surplus - Deficit

Regional Study Per Product *

	1962	1963	1964	1965	1966	1967
Bovine Cattle Live Qty.(1CC Head)	+ 827	+ 479	+ 565	+ 456	- 472	+ 673
Value ($1C,CCC)	+ 589	+ CC3C	+ 299	+ 228	- 335	+ 754
Swine Live Qty. (1CC Head)	+ 1070	+ 157	+ 354	- 23	+ 109	+ 66
Value ($1,CCC)	+ 4564	+ 163	- 1786	+14460	+ 14681	+ 12899
Bovine Meat Fresh, cold Qty(Metric tons)	- 11053	-14743	-15411	- 20350	- 23035	- 20241
Value($1,CCC)	- 659C	- 8092	-10521	- 14955	- 19868	- 19878
Swine Meat Fresh, c ld Qty(Metric tons)	- 4836	-11464	-12101	- 10094	- 14854	- 16445
Value ($1,CCC)	- 2524	- 7830	- 7718	- 5311	- 7293	- 8023
Poulty Qty (Metric tons)	- 6737	-11233	-17761	- 17823	- 21050	- 24326
Value ($1,CCC)	- 4050	- 7308	-10398	- 11066	- 13005	- 14233
Canned Meat Qty (Metric tons)	- 11031	- 7005	+ 8869	+ 14889	+ 10796	+ 1641
Value ($1,CCC)	- 9939	- 6053	+12701	+ 31921	+ 25767	+ 7595
Rice Qty (1CC Metric tons)	+ 6711	+ 6205	+ 7096	+ 7382	+ 6770	- 2543
Value ($1C,CCC)	+ 3176	+ 4564	+ 3427	- 2684	- 3661	- 7953
Maize Qty. (1CC Metric t ns)	- 20154	-20729	-24133	- 27372	- 23576	- 32823
Value ($1C,CCC)	- 15064	-13040	-17114	- 19571	- 17018	- 23390
All Oilseed Cake & meal Qty (1C Metric tons)	+119047	+141378	+147925	+158313	+123609	+121484
Value ($1,CCC)	+ 84278	+102518	+101027	+ 96473	+ 90558	+ 82757

	1962	1963	1964	1965	1966	1967
Soybean Cake Qty (10 Metric tons)	- 2634	- 156	- 1094	- 5016	- 724	- 3149
Value ($1,000)	- 2349	- 245	- 1426	- 5280	- 830	- 3192
Cottonseed Cake Qty (10 Metric tons)	+ 5587	+ 8465	+ 10510	+ 12695	+ 10613	+ 17872
Value ($1,000)	+ 3774	+ 5333	+ 7205	+ 9357	+ 10044	+ 12039
Tobacco Qty (metric tons)	+ 81261	+ 94672	+ 92689	+ 72350	+ 48694	+ 72590
Value ($10,000)	+ 1517	+ 3523	+ 2760	+ 1400	- 1057	- 1009
Soybeans Qty (10 Metric tons)	-107039	-143936	-132980	-147054	-183491	-201510
Value ($1,000)	-102298	-149127	-148420	-172947	-225994	-250620
Cottonseed Qty (Metric tons)	-145190	-154269	-166848	-209041	-245596	-186756
Value ($1,000)	- 11009	- 11675	- 14413	- 17006	- 22493	- 17684
Silk Qty (Metric tons)	+ 7433	+ 5186	+ 5147	+ 4205	+ 4477	+ 3715
Value ($1,000)	+ 65233	+ 56708	+ 41198	+ 28430	+ 29245	+ 14686
Raw Cotton Qty (10 Metric tons)	- 95133	-104687	-102754	-116054	-115937	-120609
Value ($10,000)	- 61962	- 69128	- 68900	- 74440	- 70293	- 73434
Cottonseed Oil Qty (Metric tons)	- 24808	- 23094	- 29603	+ 1261	+ 27681	+ 25458
Value ($1,000)	- 9340	- 6906	- 9168	- 442	+ 7599	+ 6791
Soybean Oil Qty (Metric tons)	- 87883	-112477	-144483	-138339	- 96909	-116053
Value ($1,000)	- 29031	- 32965	- 38778	- 44762	- 33556	- 41705

* Exports over imports = +
Imports over exports = -

Source: FAO and NEED PAG calculations

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In order to help decide which of the above products have more future potential than others, a check off system was devised. Any product having the particular characteristic described in each column is checked in that column. Checks are then total and products are ranked according to number of checks. Each check is weighted equally.

Product	Steady Volume Increase	Steady Price/Unit Increase	Processed Good	Continually Import Dependent Customer	Import Substi-tution	"Weak" Compe-tition	Large Area Deficit	Total
Bovine Meat	X	X	X	X	X		X	6
Swine Meat	X		X	X				3
Poultry	X		X	X			X	4
Maize	X	X		X			X	4
Soybean Cake			X					1
Soybean	X	X		X			X	4
Cotton-seed	X	X		X			X	4
Cotton	X			X	X		XX	5
Soybean Oil	X	X	X		X		X	5

Based on the above system, the products with the larger number of points should receive greater priority than those with fewer points.

Because soybeans appear in three different forms, the soybean industry should receive special consideration. All forms of soybean are marketable which avoids the problem of surplus of one processed form.

From this point cost of production per unit must be analyzed to see if Thai production costs plus transport costs can result in competitive prices for Thai goods.

Some problems and possible government actions are discussed in a separate paper.

Thailand is exporting some products which are not covered in detail above. Rice and kenaf are examples of this. Obviously Thailand should try to keep as a large a share of market as possible. However, all indicators are that the markets are shrinking.

A shrinking market is not one upon which a country should be concentrate its resources. Instead future growth markets should be anticipated, and Thailand should gear up to meet them.

C. Japanese Soybean Market:

Soybeans: 1960 Japanese demand for soybeans = 2.7 million tons

TABLE 7

Breakdown by Use of 2.7 Million Tons of

Raw Soybeans - 1960

Usage	Quantity (1,000 Tons)
Oil Extraction	2,010
Soybean Paste "miso"	167
Soy Sauce	13 *
Tofu, Fried Tofu	300
Frozen Tofu	35
Fermented Soybean "natto"	50
Soybean powder	15 **
Others	100
Total	2,700

* Extraction waste of soybean also used

* * Special varieties of high quality used

Annual increase in demand is expected to be between 150,000 and 200,000 tons.

Japanese production = 135,000 tons but only 60,000 tons leave the farm and enter commercial channels.

Cost of production is Japan is higher than cost of imports.

TABLE 8

Major Sources of Soybean to Japan

Year	Soy Bean Source	Quantity Tons	Average Price Per Ton
1969	U.S.A.	2,140	$107.81
	Mainland China	377	$112.37
1968	U.S.A.	2,000	$113.79
	Mainland China	417	$110.58

In general U.S. soybeans are used for oil extraction and Chinese soybeans are consumed in the home.

Different bean uses call for different bean characteristics in terms of color and size. An exporter must learn this.

Oil Content: U.S. soybeans contain 20-22 percent oil content while Thailand's SJ2 has 19-20 percent oil content.

U.S. imports are well organized being delivered in giant vessels and taken over in Japan by a few large Japanese soybean extracting companies with giant elevators, storage houses, and oil extracting plants.

Chinese soybeans are used more for miso, tofu, natto, and other non-oil purposes. More important than oil content are taste, flavor, and high protein content.

12. Japanese commercial firms have contracts for soybean imports from China.

To compete in the Japanese market will mean breaking into the oil supply market dominated by the U.S. or the "other uses" market dominated by China.

U.S. imports now have developed channels of distribution and commercial relationships have formed. To crack this Thailand must have a high oil content bean and a cheaper price.

To compete with China will mean competition in quality and perhaps a Chinese willingness to accept a monetary loss for political reasons.

Total Edible Oil Market in Japan: Japan consumes 700,000 tons of edible oil annually with the market expected to increase by 100,000 tons a year.

Other raw material sources of edible oil are:

(1) Sunflower seeds: Mainly from USSR.

(2) Kapok seeds: From Indonesia and Thailand

(3) Cottonseed: Formerly mostly from Thailand and now from Africa also. Imports amount to 250,000 to 260,000 tons yearly with 65% coming from Africa.

(4) Sesame: Japan buys 35,000 tons annually, mostly from Africa. African sesame oil content is 50 to 53% while Thai sesame oil content is 42-43%.

(5) Castor Bean: Japan imports roughly 50,000 tons of castor beans annually with a large portion coming from Thailand. Other suppliers are Mainland China and Indonesia.

Source: Haruhiko Seto - Soybean Project Japanese Team Manager

D. Japanese Beef Market:

In spite of increasing local production, Japanese beef imports have been increasing rapidly as per capita income has grown.

Table 9 shown Japanese beef imports since 1960.

TABLE 9

Year	Japan Beef Import (metric tons)	Value U.S. $1,000
1960	34,451	14,203
1961	37,400	14,086
1962	38,156	14,590
1963	91,458	32,866
1964	134,482	52,692
1965	105,909	45,174
1966	167,500	77,171
1967	183,771	88,297
1968	207,583	106,244
1969	253,914 (Through Nov. 31,1969)	147,747

Source: Japan Summary Trade Report for 1969, Japan Tariff Association, Tokyo.

Main Japanese suppliers are Australia, New Zealand, U.S.A., and Canada, all of whom suffer a transport disadvantage compared to Thailand. Thailand exports no beef to Japan.

If Thailand were to process 10,000 animals for export to Japan the total amount would be less than 1 percent of Japan's 1969 import total. (Assume 200 Kgs. of meat per animal for a total of 2,000 metric tons).

A target of 1 percent share of market would appear to be an absolute minimum target.

E. Thai Cattle Exports:

Thailand exports some live cattle but no beef. Exports are minimal. The value and destination of exports are shown in the following tables.

Year	Export Amount (Baht - FOB)	Destination
1966	1,900,000 (U.S. $90,476)	Hong Kong
	2,100,000 (U.S. $100,000)	Malaysia
	900,000 (U.S. $42,857)	Penang
	9,500,000 (U.S. $452,380)	Singapore
	Total 14,400,000 (U.S. $685,713)	
1967	1,391,000 (U.S. $69,550)	Hong Kong
	2,704,000 (U.S. $128,761)	Malaysia and Penang
	14,129,000 (U.S. $668,047)	Singapore
	Total 18,224,000 (U.S. $866,358)	
1968	46,300 (U.S. $2,204)	Hong Kong
	1,946,700 (U.S. $92,509)	Malaysia
	776,000 (U.S. $36,952)	Penang
	10,397,000 (U.S. $495,095)	Singapore
	119,000 (U.S. $5,666)	Taiwan
	Total 13,281,000 (U.S. $632,426)	

F. Timber Industry:

A more specific product by product surplus - deficit analysis follows. Emphasis is on Far East markets due to their proximity to Thailand. Japan is the major importer of most forest products, and effort should be made to penetrate the Japanese market.

A summary of the export - import situation of various wood products follows:

(1) Coniferous logs: The deficit increased from 7.82 million cubic meters in 1966 to 15.20 million cubic meters in 1968. Japan is the major market and New Zealand and North America the major suppliers. Within the Far Eastern region there are no exports of this type of log.

(2) Broadleaved logs: The Far East has run a slight deficit since 1966. The deficit has risen from 1.03 million cubic meters in 1966 to 1.30 million cubic meters in 1968. Japan is the major importer and the Philippines and Sabah the major area exporters. The Far East accounts for over 2/3 of total world exports of broadleaved logs.

(3) Pulpwood: The deficit in pulpwood has increased from 0.96 million cubic meters in 1966 to 1.05 million cubic meters in 1968. Japan is the major importer with most supplies coming from North America. There are no Far Eastern exports of pulpwood.

(4) Sawn Softwood: The Far Eastern deficit increased from 1.3 million cubic meters in 1966 to 2.2 million cubic meters in 1968. Japan is the major importer and North America the major supplier to Japan.

(5) Sawn Hardwood: The Far East is a net exporter of swan hardwood with net exports rising from 1.55 million cubic meters in 1966 to 1.80 million cubic meters in 1968. Europe is a major importer

and Malaysia and Singapore major exporters.

(6) Plywood and Blockboards: The Far East is a net exporter of Plywood and blockboards. Major area exporters are South Korea, Taiwan, and the Philippines with Malaysia and Singapore also emerging as exporters. North America is the main market for Far East exports. Exports have risen from 1.50 million cubic meters in 1966 to 2.05 million cubic meters in 1968.

(7) Particle Board: The Far East does not participate as an exporter or as an importer of particle board. Europe is the major producer and user of particle board, but demand is outstripping production.

(8) Fibreboard: The situation for fibreboard is very similar to that for particle board.

(9) Wood Pulp: The Far East is a net importer of wood pulp with the deficit growing from 0.95 million tons in 1966 to 1.10 million tons in 1968. North America is the major supplier of wood pulp.

(10) Newsprint: At present the Far Eastern share of the newsprint market is negligible.

(11) Paper and Paperboard: The Far East is a net importer of paper and paperboard with the deficit rising from 0.55 million tons is 1966 to 0.74 million tons in 1968. There are no significant exports within the region. The major supplier is North America.

Summary: There are several wood products which are now in deficit in the Far East and whose potential for development in Thailand should be investigated.

These products are:

(1) Coniferous logs

(2) Broadleaved logs

(3) Pulpwood

(4) Sawn Softwood

(5) Wood pulp

(6) Paper and Paperboard

Japan is the major importer of most of these products so more detailed market surveys should emphasise Japan.

Some Asian countries such as Malaysia, South Korea, Philippines, Taiwan, and Singapore have reacted to the market demand. Thailand has not.

Supporting surplus - deficit data for timber can be found in Annex 2.

IV.2 Trends and Outlook for Selected Thai Products on the International Market

The following is a general discussion, commodity by commodity, of the world situation for Northeast Thailand products. This is included in order to give a broader perspective to the market situation. It should be remembered, however, that the outlook within a region such as the Far East may differ from the world outlook. In other words, trade prospects within the Far East may be better for certain products than they appear for the world as a whole. Also, a share of market which may appear insignificant from an international point of view could be very significant from the point of view of one country or a region within that country.

A product by product discussion follows:

(1) Coarse Grains (Maize, Sorghum Oats, Barley):

(a) World Trade: 1968/1969 exports were estimated to be 4C million tons above the 1963-65 average and double the 1955-57 averages. Maize exports rose while sorghum fell due to an unfavorable relationship between its price and the prices of other feed grains.

Trade has leveled off since 1965-66 due mainly to the substitution of wheat and concentrates in feed mixtures-particularly in wheat growing countries and Western Europe.

Japanese imports have grown in order to support a growing livestock industry.

(b) World Stocks: With the exception of 1966-67 when stocks dropped to 4C.6 million tons, world stocks have remained slightly above 5C million tons since 1955-56.

(c) Outlook: Japan is expected to continue to increase its imports of maize in order to meet the feed grain requirements of the livestock industry. Grain feeding will continue in Europe but most demand will be

met by area supply.

Continuing wheat surpluses are expected to have two effects. These are

(i) as countries become self-sufficient or surplus in wheat, they will encourage more coarse grain production and this could increase the quantities of course grain available for export. These additional supplies will increase competition and could depress prices.

(ii) As wheat surpluses increase, there will be increasing pressure to utilize wheat as a feed grain. Wheat surpluses will make wheat more competitive. This will cut into coarse grain markets.

(iii) Feed grain production appears to be increasing more rapidly than livestock production. This could lead to depressed grain markets.

(2) Rice:

(a) World Trade: In 1968 world trade in rice declined for the third successive year. Countries where imports are decreasing are Japan, Ceylon, Hong Kong, Malaysia, and Pakistan.

Imports are increasing into Indonesia, Republic of Korea, and Singapore. However, import declines led import gains.

Developed countries have increased their share of world rice exports.

World rice production is increasing thus cutting import requirements in most countries. Even India needs less imports.

Surplus stocks are building up in Japan due to increasing production and falling consumption (since 1964/65 rice consumption per caput has been falling at an annual rate of 2 percent reflecting a rise in incomes). Japan's rice policy has been to encourage production by raising farm prices as an incentive. At present the Japanese market price is well above the international price and surplus stocks are building up. Imports into Japan have virtually ceased.

(b) Outlook: The world market is entering a volatile stage. Due to high yielding varieties, many former rice deficit countries are becoming self-sufficient. Countries formerly insignificant in world trade are now joining the competition for a shrinking world market.

Although a continued population explosion or natural disasters could alter the situation, it is expected that at least for the medium term future, world rice production will increase resulting in larger stocks and increasingly competitive world rice market.

Japan appears to have left the ranks of rice importers permanently.

Because of changes in import markets and export sources, any country expecting to export will have to keep in close touch with the world rice situation, be able to react quickly to export possibilities, and be willing to negotiate prices and terms. Long term credit could be a key issue. An international arrangement to stabilize prices may also be necessary.

(30) Meat (beef, pigmeat, mutton, poultry):

(a) World Trade and Production:

Meat production as a whole has increased gradually since the mid 1950s. The bulk of production (roughly 2/3) occurs in "developed" countries as opposed to developing and centrally planned countries.

The Far East (excluding Australia and New Zealand) exports very little meat.

Most beef consumption occurs in wealthier countries where consumers have sufficient income to be able to afford beef. Few Far Eastern markets have achieved this position. Japan has increased its import quota for beef, but the total amount is not large. Japan is also stressing local beef production. Japan imported over 100,000 tons of mutton in 1968 (from New Zealand and Australia)

Poultry exports are also increasing with Hong Kong and Japanese imports increasing quite sharply (Hong Kong from 13,000 to 24,000 tons and Japan from 8,000 to 14,000 tons from 1967 to 1968).

(b) Outlook: A gradual increase in consumption is expected in wealthier countries with present sources of supply easily keeping pace with demand.

In Asia some continued meat demand is expected in wealthier markets such as Hong Kong and Japan.

(4) Oilseeds, Oils, and Fats:

(a) Production and World Trade: In 1968 world output of fats and oils rose for the 11th straight year. Output of soybean oil, the most important of the liquid edible oils, also rose. However, the soybean oil output increase was not as great as the increase in soybean production which resulted in increased stocks of soybeans and exports of raw soybeans.

Trade of oils also increased. Japan increased the amount of raw soybean imports.

In spite of an increasing volume of exports, the total value of exports has declined since 1966. This is due to the continued ample supply of raw materials. The exception to this trend was lauric acid oils - mainly coconut oils - but in this case production declined thus increasing the market price.

In contrast to the general trend for oils, the prices of raw oilseeds increased. This was due to a continued demand for seeds, particularly for oilcake production.

Production of oilseeds has recently increased in developing countries as have exports of raw seeds from developing countries.

(b) Outlook: Supplies are expected to be more than sufficient to meet foreseeable demand. Production should continue to rise. Coconut oil production is being stressed in the Philippines and palm oil in Malaysia and the Ivory Coast. India is emphasizing groundnut production as well as Africa.

It appears that market saturation in developed countries is being reached with future demand being more a function of population growth. Developing countries which are not self-sufficient have difficulty financing imports and centrally planned countries are now exporters.

(5) Tobacco:

(a) Production and World Trade: In 1968 world production was down slightly while exports and imports were almost unchanged. World stocks increased thus staying at high levels. Variations in production and trade over the past few years have been slight.

(b) Outlook: No substantial changes in production, exports, or imports can be expected. Large world stocks will prevent ny price rises even if climatic conditions are unfavorable.

The general market appears to be fairly stable with no reason for rapid growth or change.

(6) Cotton:

(a) Production and World Trade: Cotton production in 1968 was 10% above 1967, but it still was not sufficient to fulfill total demand. This situation resulted in a drawdown of world stocks for the third successive year. However, there was only a very slight difference between production and consumption in 1968 and total world stocks are still quite large. (at the end of 1968 existing stocks were equal to 40% of total 1968 demand).

The United States showed the sharpest production gain followed by the Near East. However, consumption in the United States declined.

Demand in 1968 rose in the Far East (particularly in Japan and mainland China). However, total imports into developed countries fell for the third straight year. Developing country imports were up 5% in 1968 due mainly to crop shortages in India and rising consumption in Taiwan and Korea.

Since the 1955/57 period total raw cotton export earnings have not increased greatly. However, the composition of the exporters has. The earnings of developed countries have fallen, developing countries earnings have remained stable, and the earnings of centrally planned countries have risen.

During the period that export earnings have remained steady, total tonnage exports have increased. Value per ton is declining.

Exports of cotton manufactures from developing countries rose 11% in 1968. Hong Kong, Taiwan, and South Korea raised exports of piece goods and clothing to western Europe and the United States while India and Pakistan increased exports of yarn and piece goods.

(b) Outlook: Developed countries are expected to use more and more synthetics at the expense of cotton. Even developing countries are utilizing more man-made fibers.

Areas where cotton manufacture are expected to increase are Japan (in spite of falling exports of cotton cloth and increasing competition in the domestic market from man-made fibers), Taiwan, and South Korea. Hong Kong is importing more yarns rather than cotton for its clothing manufacture.

On the whole world consumption will probably level off. Even though cotton consumption may increase in some developing countries, most cannot be seen as large potential markets for two reasons:

(i) these countries will attempt to become self-sufficient and

(ii) the problem of foreign exchange to pay for imports.

(7) Kenaf:

(a) Production and World Trade:

World production of jute and kenaf fell in 1968/69 due mainly to falls in output in India, Pakistan, and Thailand. This resulted in price rises. The price rise has resulted in larger export earnings. Thailand drew down stocks in order to meet demand.

World import demand in 1968/1969 was roughly the same as 1967/68 but lower than 1966/67 when India was a large buyer. Imports of Western Europe and most other developed countries fell but were compensated for by a rise in Indian imports needed because of a bad crop. Japan, the worlds second largest buyer, mainly of kenaf, imported more.

Pakistan is producing more and more jute goods thus cutting into the Indian position of being the number 1 producer and exporter of jute goods. Output of jute goods in western Europe has fallen.

(b) Outlook: The synethetic, polypropylene, is getting an increasingly large share of developed countries markets for heavy duty bags and carpet backing. The recent high price of jute and kenaf encouraged buyers to buy polypropylene. The recent high prices will also encourage more production which should result in lower prices - this will make jute and kenaf more competitive but will be discouraging to the producer. Greater Indian production will reduce Indian demand for imports and thus cut world demand substantially. This will also cut world prices.

The future appears to be one of diminishing markets and increased competition from synthetics. Japan may also turn more and more to synthetics. This implies a need for production cost cuting and improved quality if natural fibers are to maintain any share of market. It is not a situation of growing markets but instead a competitive battle to maintain a share.

(8) Hides and Skins:

(a) Production and World Trade:

In 1968 the output of cattlehides and sheepskins increased while that of calf and goatskins declined. Fashion demands in developed countries are responsible for much of the demand for skins. Japanese imports of cattle hides rose by 20% in 1968.

The continued demand was not strong enough to support prices, however, and the value of exports declined in 1968. The value decline was particularly sharp for developing countries.

It should be noted, however, that the value decline is for raw hides and skins. The value of semi-tanned and finished leather increased in 1968.

(b) Outlook: Demand is expected to continue to grow due to fashion requirements. However, supply is also expected to grow as meat production increases. Increasing supply should keep to price down as well as increasing competition from synthetics.

Tanning and hide processing will become more and more important to the amount of exports a country may expect. Quality will be the critical factor.

(9) Forest Products:

(a) Production and World Trade:

Demand for forest products in 1963 was quite firm with pluses being recorded for almost every category. Demand was caused mainly by requirements in Western Europe and North America.

Japanese imports in some categories were down slightly, but Japan remained the leading importer of tropical forest products.

Developing countries export earnings were up due to better prices and also because more countries were exporting processed or semi-processed products rather than just logs.

The most important exporters of tropical forest products in the Far East are the Philippines, Malaysia and Burma along with Taiwan, Singapore and South Korea which export plywood and veneer produced from imported tropical logs.

(i) Roundwood: Demand for industrial roundwood was up with increasing exports from North America to Japan. Sabah and the Philippines remained the leading exporting countries of broadleaf logs and Japan remained the major market. Indonesian production was increasing. Japan also served as a major market for coniferous logs (from New Zealand and North America) and pulpwood chips.

(ii) Sawnwood: Far Eastern exports of sawn hardwood to Europe increased. Malaysia and Singapore were major suppliers. The Far East imported some sawn softwood but exported almost none.

(iii) Wood-based panals: Plywood production rose in the Far East with North America as a major market. Important producers were South Korea, Taiwan, Philippines, Malaysia, Singapore, and Japan. Far Eastern production accounted for roughly 20% of the world total in 1968. In exports the Far East accounted for over 40% of World exports of plywood and blockboards.

Europe dominates world fibreboard and particle board exports and imports.

(iv) Pulp and Paper: The Far East produces some pulp and paper but exports are insignificant. Imports have increased. Europe and North American dominate production, exports, and imports.

(b) Outlook: In general the market for wood products appears fairly strong but no spectacular growth is anticipated. The influence of construction in North America on the whole market is strong. There is still adequate capacity to handle pulp and paper demand. Asian exports of broadleaved logs (from South East to East Asian countries) are expected to continue to grow as well as Asian exports of plywood and veneers to North America and sawn hardwood and plywood to Europe.

(10) Oilcakes and Meals:

(a) Consumption: World consumption of oilcakes has increased from 27 million tons in 1955 to 50 million tons in 1968. Developed countries consumption increased to 30 million tons (doubling since 1955), centrally planned countries consumption increased 60% to 12 million tons, and developing countries consume 5 million tons.

The world's largest consumer is the United States, followed by West Germany and Japan. Mainland China also consumes quite a bit while India leads all other developing countries in consumption.

The basic use of oilcakes is as a concentrate used for animal feed. Oilcakes are valued basically for their protein content. Protein content varies and some oilcakes contain a better protein balance (in terms of amino acids) than others. The balance of soybean cake is better than most others.

Japanese consumption reached 3 million tons in 1968. Some oilcake in Japan is used for fertilizer and human food, but the growth in oilcakes use is occurring in the livestock feed sector.

Indian consumption is around 2 million tons.

Western European consumption is increasing steadily.

(b) Production: 60% of the oilcake production increase has been from soybeans. Almost all soybean production increase occurred in the United States.

The Far East has lagged well behind other regions in oilcake production.

(c) World Trade:

Developed countries accounted for roughly 90% of the total world imports. Western Europe and Japan are the major importers. From 1955 to 1968 Japanese imports of oilcakes and oilseeds increased from 0.8 million tons to 2.7 million tons. Japan imports a large amount of seeds and processes then in Japan.

Soybeans are the largest single kind of oilcake export.

Developing countries have increased their oilcake exports while keeping oilseed exports constant. Developed countries have increased both oilcake and oilseed production.

(d) Demand and Outlook:

Demand is influenced mainly by two factors:

(i) Changes in output of livestock products and

(ii) Changes in livestock feeding practices.

Demand for meat milk and eggs has risen rapidly along with personal incomes in Western Europe and Japan. Livestock production in Japan has trobled since 1955. Over the same period oilcake consumption increased fivefold in Japan.

Oilcake usage as livestock feed has increased as feeders recognize the value of high protein feeds.

Demand for oilcake has outstripped the demand for oil thus making a low oil content seed more desirable. Soybean appears well suited here.

Future trade prospects for oilcake appear linked to developments in Western Europe and Japan. FAO foresees no increase in oilcake production in Japan but cake requirements for livestock

feed are increasing. Thus in the medium term future market prospects for cake and seed in Japan appear good.

One potential problem is the development of synthetic feeds. They are being used increasingly in the United States, and Japan may develop such factories.

Generally speaking, oilcake markets appear more promising than oil markets thus raising the problem of what to do with the oil. Efforts will have to be made to find international outlets or use more domestically. Raw seed imports into Japan should continue and competition to fill this market should increase.

Table 10 summarizes the distribution of trade by regions of the world. The table illustrates the percentage quantity and value exported and imported of each product by each region.

TABLE 10

Distribution of Trade - Percentage Per Region - 1967

In Terms of Quantity & Value

	Product	Europe Qty %	Europe Value %	USSR Qty %	USSR Value %	North Central America Qty %	North Central America Value %	South America Qty %	South America Value %	Asia* Qty %	Asia* Value %	Africa Qty %	Africa Value %	Oceania Qty %	Oceania Value %
1.	Bovine Cattle Live-Exports	.58	.72	-	-	.21	.12	.05	.07	.06	.04	.07	.03	.001	.002
2.	Bovine Cattle Live-Imports	.58	.69	.02	.01	.20	.14	.055	.07	.05	.03	.06	.03	0	0
3.	Swin Live Exports	.39	.57	-	-	.02	.02	-	-	.59	.41	-	-	-	-
4.	Swine Live Imports	.39	.61	-	-	.02	.02	-	-	.59	.36	-	-	-	-
5.	Fresh Chilled Swine Meat Exports	.40	.47	-	-	.04	.06	.29	.20	-	-	.03	.03	.23	.25
6.	Fresh Chilled Bovine Meat Imports	.69	.66	-	-	.24	.28	.02	.01	.01	.01	.02	.01	-	-
7.	Swine Meat Exports	.86	.87	-	-	.10	.11	.02	.01	-	-	.01	.01	-	-
8.	Swine Meat Imports	.87	.87	-	-	.07	.08	.01	.01	.04	.02	.01	.01	-	-
9.	Poulty Meat Exports	.83	.83	-	-	.17	.17	-	-	-	-	-	-	-	-
10.	Poulty Meat Imports	.77	.77	.08	.09	.05	.04	.01	-	.07	.07	.01	.01	.01	.01
11.	Canned Meat Exports	.63	.66	.03	.02	.03	.03	.19	.18	.04	.04	.05	.04	.04	.03
12.	Canned Meat Imports	.51	.51	.02	.01	.35	.40	-	-	.03	.03	.03	.03	.02	.01
13.	Rice Exports	.05	.05	-	-	.26	.28	.04	.04	.52	.50	.07	.07	.01	.01
14.	Rice Imports	.12	.13	.06	.06	.05	.05	.01	.01	.56	.56	.10	.09	.10	.10

	Product	Qty %	Value %	Qty %	Value %	Qty %	Value %	Qty %	Value %	Qty %	Value %	Qty %	Value %	Qty %	Value %
		Europe		USSR		North Central America		South America		Asia*		Africa		Oceania	
15.	Unmilled Maize Exports	.15	.20	-	-	.52	.50	.18	.16	.04	.04	.10	.09	-	-
16.	Unmilled Maize Imports	.74	.74	.01	.01	.04	.04	-	-	.17	.17	.01	.02	-	-
17.	All Oilseed Cake & Meal Exports	.15	.16	.04	.04	.33	.37	.16	.14	.16	.14	.12	.11	-	-
18.	" " " & " Imports	.93	.93	-	-	.04	.04	-	-	.03	.03	-	-	-	-
19.	Soybean Cake Exports	.18	.19	-	-	.78	.77	.04	.03	-	-	-	-	-	-
20.	" " Imports	.91	.91	-	-	.07	.07	-	-	.01	.01	-	-	-	-
21.	Cottonseed Cake Exports	.03	.03	-	-	.15	.14	.12	.10	.16	.18	.27	.26	-	-
22.	" " Imports	.94	.95	-	-	.04	.04	-	-	-	-	-	-	-	-
23.	Tobacco Exports	.24	.25	-	-	.33	.46	.08	.03	-	-	.11	.09	-	-
24.	" Imports	.64	.68	.06	.06	.13	.13	-	-	.06	.09	.06	.04	.02	.02
25.	Soybeans Exports	-	-	-	-	.89	.88	.04	.03	.07	.06	-	-	-	-
26.	" Imports	.59	.58	-	-	.06	.05	-	-	.32	.33	-	-	-	-
27.	Cottonseed Exports	.02	.02	-	-	.28	.32	-	-	.10	.09	.50	.48	-	-
28.	" Imports	.17	.18	-	-	.04	.05	-	-	.67	.65	-	-	-	-
29.	Silk Exports	.16	.23	.14	.05	-	-	-	-	.66	.68	-	-	-	-
30.	" Imports	.56	.51	-	-	.09	.15	-	-	.33	.32	-	-	-	-

	Product	Europe Qty %	Europe Value %	USSR Qty %	USSR Value %	North Central America Qty %	North Central America Value %	South America Qty %	South America Value %	Asia* Qty %	Asia* Value %	Africa Qty %	Africa Value %	Oceania Qty %	Oceania Value %
31.	Raw Cotton Exports	.04	.04	.14	.17	.36	.30	.08	.08	.05	.04	.21	.26	-	-
32.	" " Imports	.52	.52	.04	.05	.04	.04	.01	.02	.36	.04	.02	.01	-	-
33.	Cotton Seed Oil Exports	.01	.04	-	-	.21	.48	.04	.06	.13	.26	.56	.09	-	-
34.	" " Imports	.20	.17	-	-	.11	.11	.14	.14	.03	.03	.46	.48	-	-
35.	Soybean Oil Exports	.18	.17	-	-	.79	.81	-	-	.01	.01	-	-	-	-
36.	" " Imports	.31	.27	-	-	.05	.05	.10	.11	.24	.29	.19	.18	.01	.01

* Refers only to those Asian Countries shown in Annex 1

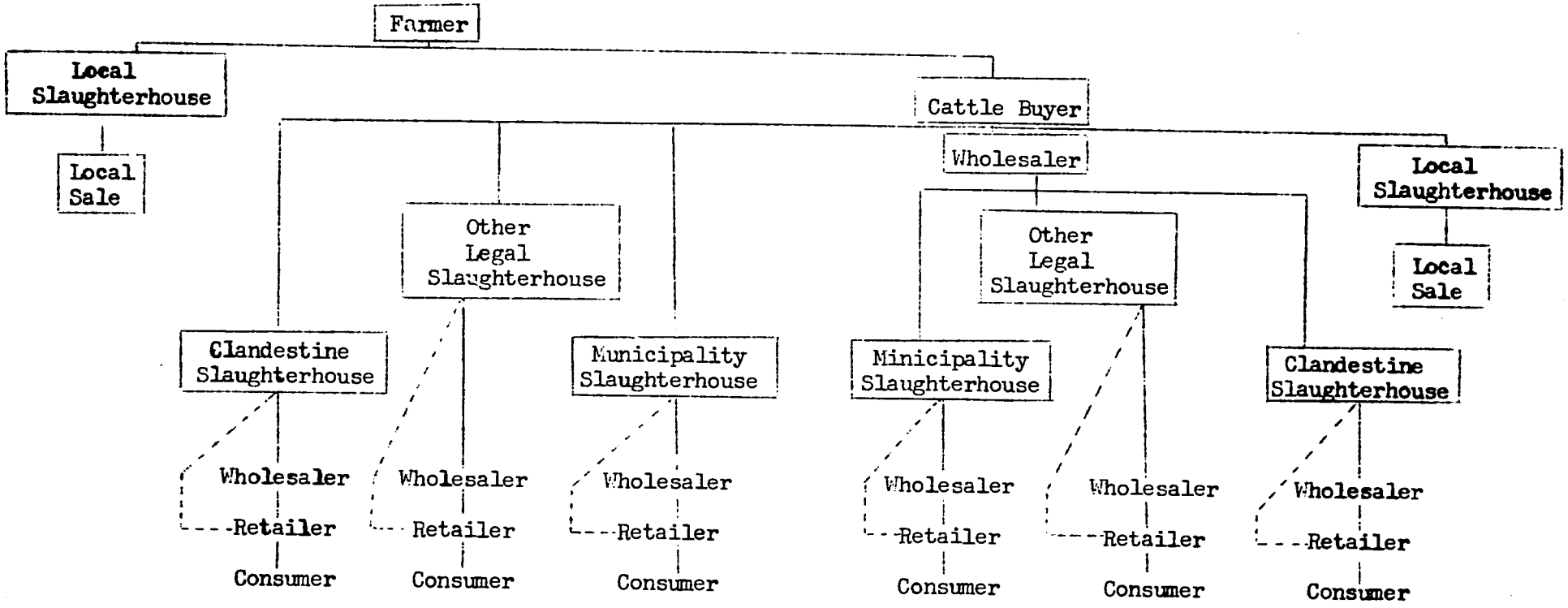
V. Distribution System:

The movement of farm products to ultimate consumer is an integral part of the total marketing system. Distortions or irregularities within the distribution system affect producers and consumers and can result in reduced production and consumption.

Parts V.1 and V.2 discuss livestock and crop distribution systems respectively. Serious problems exist in both systems and more detailed studies examining specific problems will be done in the future.

V.1 Livestock Distribution System:

The movement of cattle, buffolo, and hogs follows the routes shown in the following diagram. This covers the system within Thailand. Export systems have not been analyzed.



NOTE: In some cases the slaughterhouse actually buys the animals and then sells the carcasses while in other cases the slaughterhouse custom slaughters for wholesalers for a fee. In the clandestine operation the cattle buying, slaughtering, and wholesaling is often run by the same person(s). Some clandestine operations are well - intergrated.

The distortions within the livestock distribution system are numerous and serious. From preliminary analysis, it appears that both producer and consumer are suffering due to these distortions.

Some of the key distortions are:

(a) Legal versus illegal slaughtering operations:

This problem is very serious in the Bangkok area where numerous illegal operations exist and do not pay federal or municipal taxes nor is their meat inspected. Legal slaughterhouses pay taxes and inspect meat thus creating extra costs for the wholesaler utilizing legal slaughter operations. All meat, no matter where slaughtered, retails at a similar price. Thus illegal slaughterers get a higher margin than legal slaughterers. The consumer often gets uninspected diseased meat.

(b) High margins: Preliminary studies indicate that the producer share of the final retail value of meat is quite small compared to other countries in the world. This appears due to high margins between the producer and the ultimate consumer.

(c) Unofficial taxes on the highway ranging from 200 to 300 baht a truck from Korat to Bangkok alone.

(d) Dishonest scales at various points in the system and low weight estimates by buyers to farmers.

(e) No grading system.

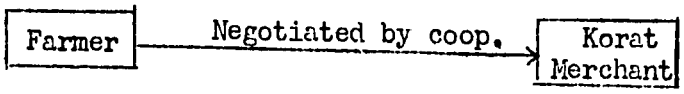
The meat export problem is complicated by the presence of foot and mouth disease, and there is very little action to resolve the problem. Thai meat remains unacceptable to major importers such as Japan.

Special livestock studies dealing with the specific problems are under preparation.

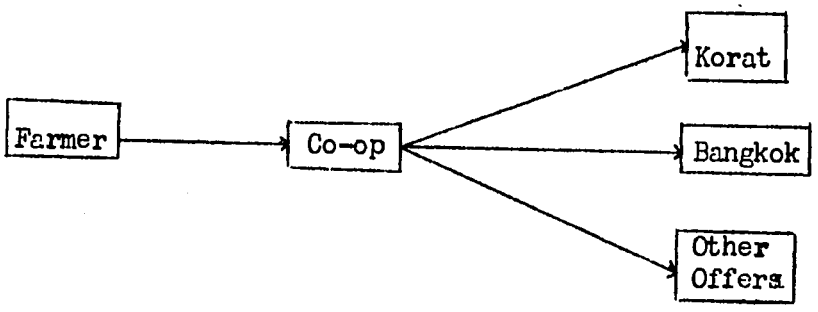
V.2 Crop Distribution System:

There are at least 5 different types of distribution systems which presently serve to move farm commodities from the producer to the wholesaler or retailer in the Northeast. In addition, each of these five systems has certain variations depending on the actual crop.

(a) The cooperative system (e.g., Saraphee): Here the cooperative has dealt directly with merchants in Korat, thus bypassing local merchants.



When the cooperatives develop warehouse facilities, the farmers will bring their products to the co-op which will handle the marketing and sell to various markets.



A cooperative eventually may be able to deal through a central co-op in Bangkok to handle product exports.

This system presently accounts for about one percent of all agricultural trade and the margin is approximately 20 - 35 percent. 1/

(b) The Farm Association (e.g., Mahasarakham):

This appears some what similar to the cooperative system. Thus far this association has not changed old marketing patterns. It eventually hopes to have facilities in terms of warehousing and transport to be able to store goods and to sell, when the price is favorable, to larger market centers such as Khon Kaen.

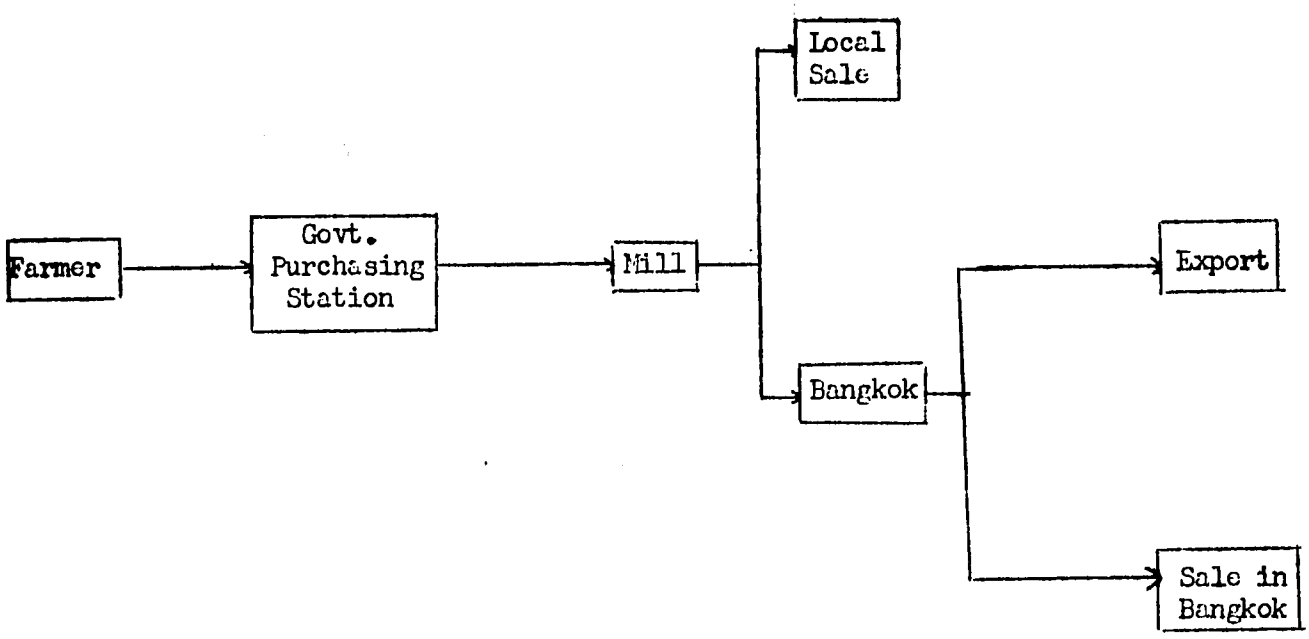
The goal is:

It does not appear that the farm associations envisage the type of integrated system which cooperatives hope to achieve.

This system presently accounts for about one percent of all agricultural trade in the Northeast and the margin is approximately 20 - 35 percent.

(c) The government system (e.g., rice purchasing program): In this case the farmer delivers his rice to the government purchasing station. It is then milled and either sold locally or moved to Bangkok where the government operates a large central warehouse (capacity 50,000 tons). In Bangkok it is either used to fill government to government orders or is sold in Bangkok.

1/ Margins refer to profits, transport costs, special fees, and all other costs between producer and consumer.



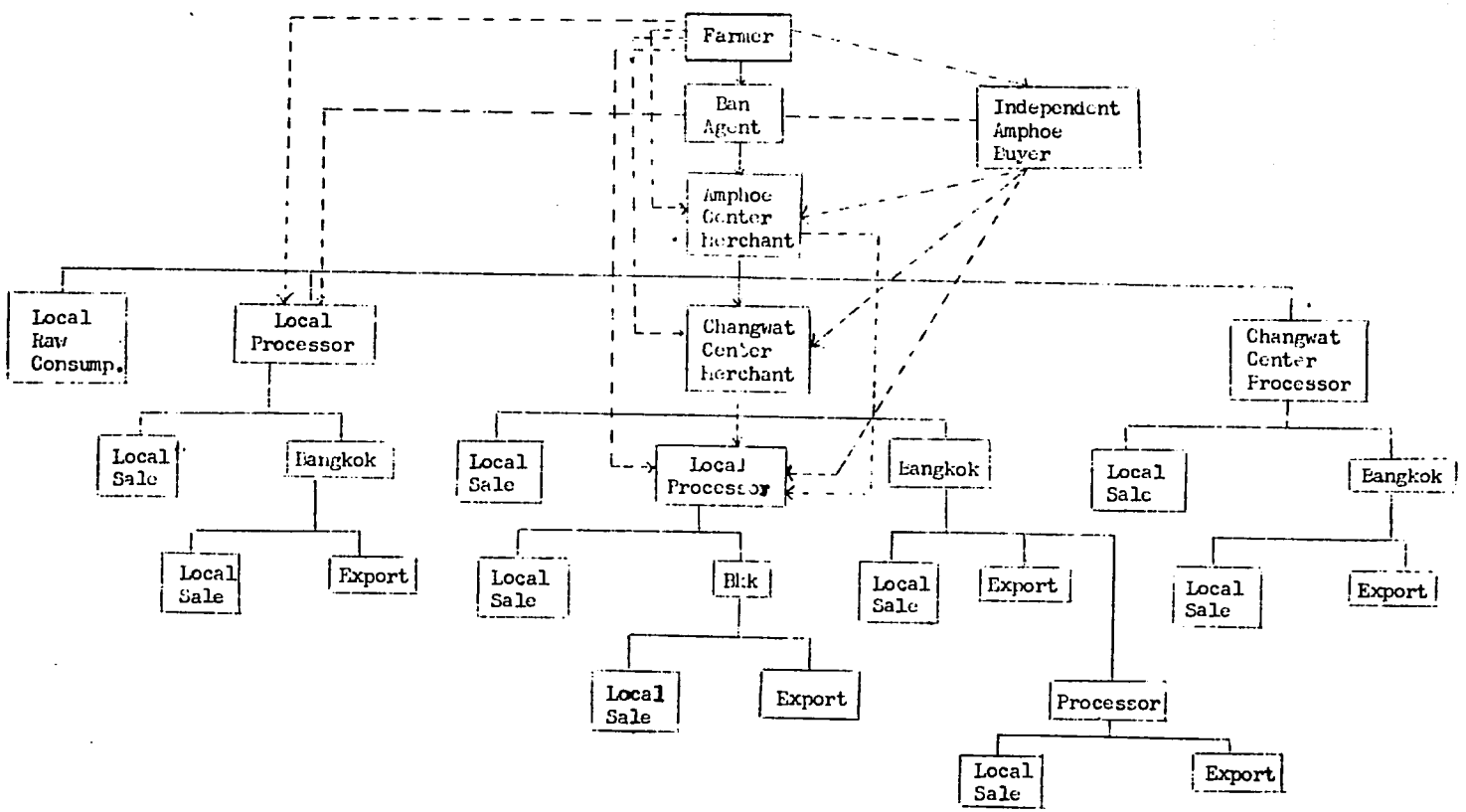
The system percently accounts for twenty percent of all rice trade in the Northeast and the margin is 25 - 40 percent.

(d) The merchant system:

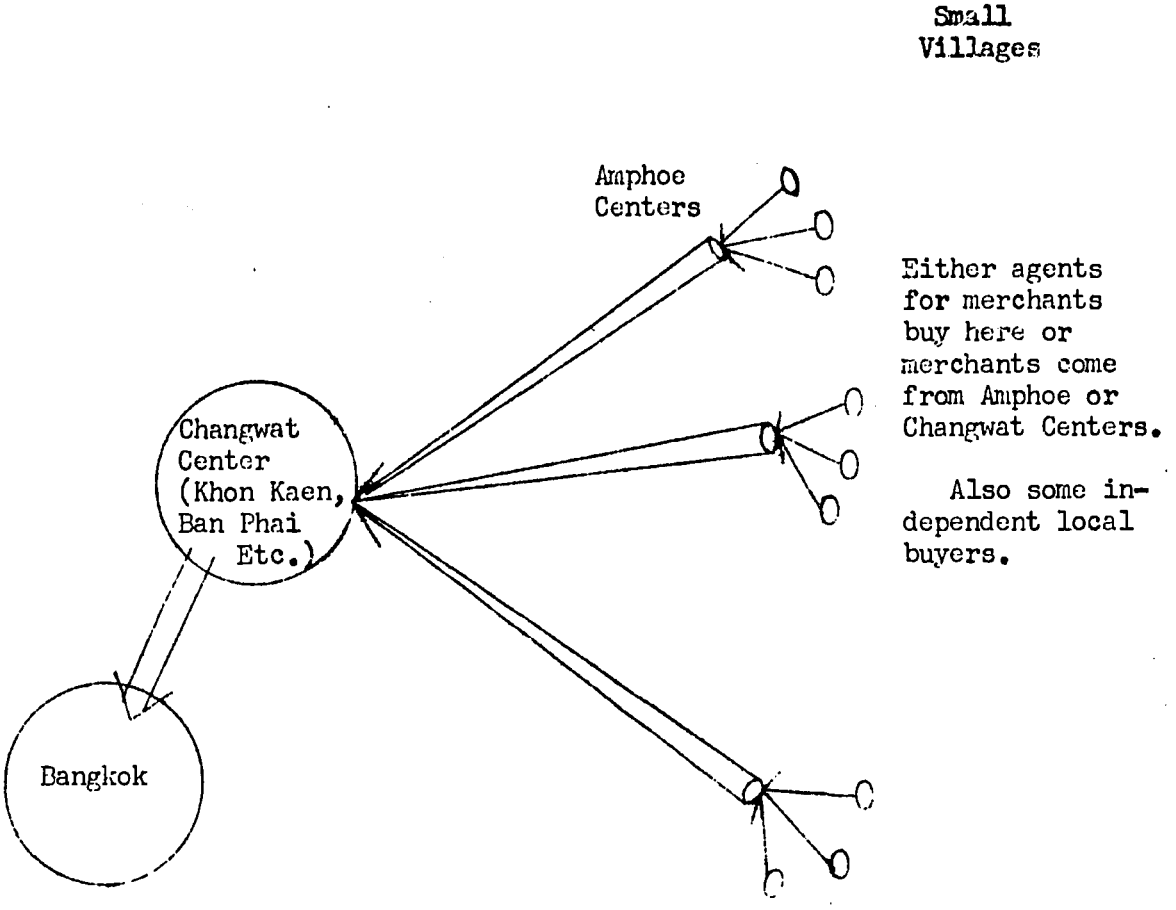
This is the oldest system. It has many variations and is commonly known as the "middleman" system. It is this system, or parts of it, which the three previously described distribution systems are trying to circumvent. Some of the possible flow routes are shown on Chart 5-1.

The solid lines show the "regular" system while the broken lines represent atternatives also in use.

Chart 5 - 1
Merchant Distribution System
Northeast Thailand
1969



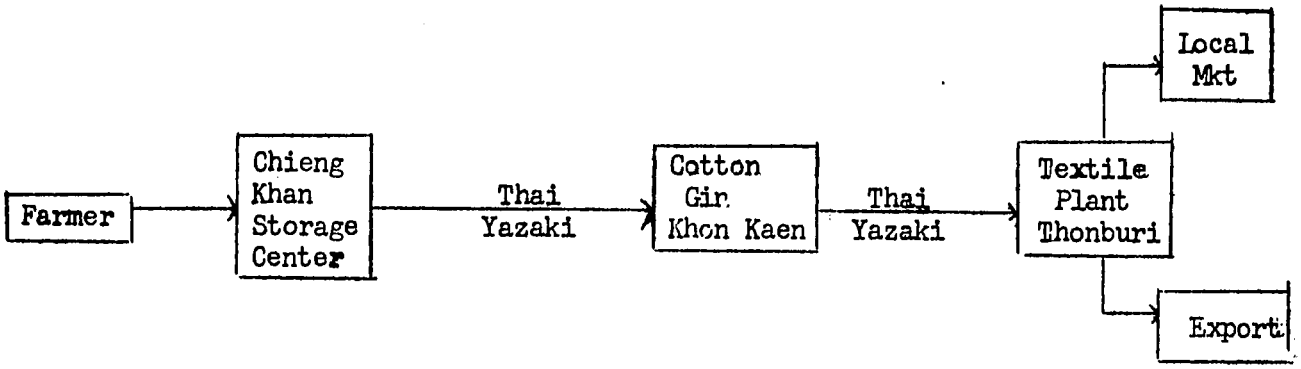
A more simplified diagram showing product movement in terms of population centers is:



This system presently accounts for over 90 percent of all agricultural trade in the Northeast and the margins are 30 - 55 percent, depending on the product, the number of dealers it passes through, and the amount of processing the product passes through.

(e) The integrated system (e.g., Thai-Yazaki):

In this case, once the product leaves the farmers field it is taken over by the company which transports it, processes it, and eventually sells it to a retailer or to the ultimate consumer. It is a completely vertically integrated in - house system.



This system presently accounts for twenty percent of all cotton trade in the Northeast and the estimated margins are 10 to 15 percent.[1/]

Of the 5 listed distribution systems, the merchant system is carrying the bulk of the farm commodities and is providing the bulk of the farm inputs. None of the other systems has reached a point where it could replace the merchants.

1/ These margins are incorporated in the manufacturing value added account.

There are, at times, some unnecessary steps in the merchant system when products are handled by an excessive number of traders - some of whom serve no real purpose or perform no useful function. This results in a lower price to the producer. There are some examples of collusion among traders concerning price setting for certain commodities which also hurts the producer. However, on the whole, the merchant system is providing an essential service to the farmer at a reasonable cost. To replace it would require large capital investments and a large number of well - qualified business - oriented personnel.

A strong cooperative or farm association movement could replace many of the steps in the merchant system, but skilled people are needed to direct such movements. It is difficult to get people with such skills to live in rural areas working to develop cooperatives and farm associations.

Although the concept of the program is sound, the present government alternative as represented by the rice program leaves much to be desired. Bureaucratic delays and special "fees" at the purchasing stations tend to alienate farmers. In order to really affect the price of rice, the program will need much more capital and physical plant (siloes etc.) as well as large numbers of dedicated, service oriented personnel.

The cost of establishing an effective rice program far exceeds the benefits which would be generated. In fact, if problems such as special "fees" continued, the program could serve to alienate more and more farmers from the government.

The Thai-Yazaki example looks promising and could serve as an example for other industries. It is important, however, that a free market situation be encouraged as a one company domination of any particular product could lead to harmful monopolistic purchasing practices.

There is no single best system. Instead there are good points within each system and it is these good points which must be coordinated or meshed. The merchant system is too important to replace completely, but some of the unnecessary steps within the merchant system could be avoided. Cooperatives and Farm Associations could work with the merchant system by selling direct to changwad merchants rather than local dealers or excess middlemen and thus command a higher price for the commodity. In this way the merchant system could assist the development of the other systems.

MARKETING APPENDIX

ANNEX 1

Backup Data on National Demand

ANNEX 1

TABLE 1

Cotton - Production and Market

TABLE 1 - 1

Cotton Production in Thailand 1961 - 1967

(Conversion Factors: Seed 60%, Fiber 40%)

Year	Area Planted Rai	Production Seed Cotton Tons	Fiber Tons	Seed Tons	Seed Cotton Production Baht/Kilo	Market Value Million Baht
1961	358,000	38,300	15,320	24,980	4.38	167.8
1962	371,000	41,300	16,520	24,780	3.67	154.1
1963	456,000	48,600	19,440	29,160	3.35	162.8
1964	419,000	49,100	19,640	29,460	2.80	137.5
1965	471,000	59,800	23,920	35,880	4.08	244.0
1966	391,737	45,000	18,000	27,000	4.08	
1967	523,402	60,000	24,000	36,000	4.10	

Source: Agriculture Statistus of Thailand, 1964-65 Ministry of Agriculture Division of Ag. Econ. 1966-67 figures from Dept. of Extension Service Fiber Crop Division - Ministry of Agriculture.

Cotton Production is concentrated in 15 changwats in Central Plain, North and Northeast.

Special difficulties are:

(1) Making seeds of selected varieties available to farmers;

(2) Serious pest and insect problems resulting in higher production costs.

TABLE 1-2

* Seed Cotton Production in Northeast 1961-65

Year	Area Planted Rai	Production Tons	Per Cent of Total Thai Production
1961	130,500	15,161	39.6%
1962	130,000	14,689	35.5%
1963	116,300	13,546	27.9%
1964	121,800	15,483	31,5%
1965	121,800	15,863	26.5%

*Cotton as picked including seed

Source: Ag. Stat. of Thailand 1964-65

Min. of Ag. - Div. of Ag. Econ.

Table 1-3 breaks down production by Changwat in the Northeast.

TABLE 1-3

Seed-Cotton Production in the Northeast by Changwads

1961 - 1965

Changwad	1961		1962		1963		1964		1965	
	Area Planted Rai	Production Ton	Area Planted Rai	Production Ton	Area Planted Rai	Production Ton	Area Planted Rai	Production Ton	Area Planted Rai	Production Ton
Kalasin	3,294	329.4	3,610	361.0	1,326	108.4	1,384	207.6		
Khon Kaen	6,751	675.1	19,586	1,956.8	10,206	1,020.6	6,002	894.6		
Chaiyaphom	6,268	626.3	6,641	647.6	4,219	379.3	1,363	122.4		
Nakornpanom	1,054	105.4	1,682	168.2	4,292	358.9	5,277	527.7		
Korat	2,451	302.5	2,779	326.3	2,731	311.6	8,701	1,035.1		
Burirum	-	-	-	-	3,100	248.0	208	31.2		
Mahasarakam	14,014	1,583.0	9,405	1,095.2	7,100	771.5	7,106	692.7		
Roi-et	3,662	439.4	2,344	281.2	2,992	299.2	3,434	343.4		
Loei	71,512	8,592.0	58,700	7,044.0	65,000	8,450.0	68,867	9,661.2		
Srisaket	5,501	659.5	1,982	237.2	1,298	64.9	697	62.3		
Sakolnakorn	6,821	675.2	4,754	469.1	3,019	300.9	3,050	304.7		
Surin	3,110	373.2	3,812	465.0	838	80.8	565	44.3		
Nongkai	1,500	150.0	3,005	300.5	1,700	170.0	3,950	395.0		
Udorn	2,316	276.1	10,134	1,196.8	5,620	702.5	7,578	945.3		
Ubol	2,111	373.6	1,503	149.3	2,832	278.8	2,413	214.7		
Total	130,465	15,160.7	129,937	14,689.2	116,283	13,545.4	121,795	15,482.2		

Apart from potential regional exports, there is also an import substitution market. Cotton imports and exports from 1957 through 1968 are shown in Table 1-4

TABLE 1-4

Cotton Imports and Exports for Thailand

	Imports		Exports		Trade Balance		
	Ton	Bahts	Tons	Bahts	Tons	Bahts	
1957	102	492,847					
1958	833	6,215,792	11	44,904	-822	-6,170,888	58
1959	2,041	15,906,988	20	129,787	-2021	-15,777,201	59
1960	4,923	59,149,264	106	459,844	-4817	-58,689,420	60
1961	8,730	110,999,709	292	1,031,040	-8438	-109,968,669	61
1962	8,154	100,739,993	321	875,728	-7833	-99,864,265	62
1963	9,490	112,418,215	614	2,727,646	-8876	-109,690,569	63
1964	10,481	124,398,720	260	868,945	-10221	-123,529,775	64
1965	24,723	291,578,946	167	612,134	-24556	-290,966,812	65
1966	24,406	297,434,447	484	1,489,192	-23922	-295,945,255	66
1967	24,728	277,592,423	375	1,586,280	-24353	-276,006,143	67
1968	22,738	230,389,976	3,794	7,124,465	-18944	-223,265,511	68

Source: Dept. of Customs

The quantity of imports is significant enough to result in a fairly large market for local cotton producers. However, before local cotton can compete successfully it must be comparable to imports in price and quality.

Comparative Prices:

As shown in Table 1-1 the price per kilo of seedcotton has varied from 4.38 baht in 1961 to 2.60 baht in 1964 and back to 4.10 baht in 1967.

Assuming a ratio of 35% of fiber from seedcotton the actual cost of fiber at different seedcotton price levels is shown in Table 1-5.

TABLE 1-5

Actual Cost of Fiber at Different

Seed Cotton Price Levels

Cost of Seed Cotton	Cost of Fiber
2.00 baht/kilo	5.71 baht/kilo
3.00 "	8.57 "
3.50 "	10.00 "
4.00 "	11.42 "
4.20 "	12.00 "
4.50 "	12.85 "

Imported cotton fiber has had the following CIF prices according to the Department of Customs:

Year	Cost
1963	10.97 baht/kilo
1964	11.80 "
1965	15.84 "
1966	12.21 "

Import duty of 0.33 baht/kilo must be added to all above prices.

Table 3-6 compares the price of local fiber per kilo to the price of imported fiber per kilo (including import duty)

TABLE 1-6

Local versus Import Prices of Fiber

Year	Local Fiber Price	Imported Fiber Price *
1963	9.58 baht/kilo	11.30 baht/kilo
1964	8.00 "	12.13 "
1965	11.67 "	16.17 "
1966	11.67 "	12.54 "

The price of local cotton remains under the import price. The high level of imports must therefore be due to lack of local supply to meet demand and the higher quality of imported fiber.

One way to resolve the production, disease, and quality problems is through an operation such as Thai Yazaki in Khon Kaen.

* Including Import Duty

The Ministry of Agriculture can also be involved through determining which areas can support cotton, developing better varieties, distributing better seed to farmers, assisting farmers in planting, care, and harvesting of cotton as well as providing some of the technical inputs necessary.

Because of the cost of insecticides and their necessary frequent application, credit is often a problem for the farmer. Dealers provide the bulk of it. Additional credit through the Agricultural Bank could help prevent rising interest charges due to scarcity of capital for loans.

TABLE 2

Tobacco* Imports and Exports
Thailand

Year	Imports		Exports		Trade Balance	
	Metric Tons	Million Bahts	Metric Tons	Million Bahts	Metric Tons	Million Baht
1957	5,394	180	6,728	100	+1334	-80
1958	5,300	179	5,781	85	+ 481	-94
1959	6,631	154	1,235	16	-5396	-138
1960	3,938	93	1,696	21	-2242	-72
1961	5,755	181	1,133	12	-4622	-169
1962	3,875	126	2,628	30	-1247	-96
1963	3,673	121	3,750	41	+ 77	-80
1964	4,957	162	6,147	79	+1190	-83
1965	5,308	161	6,001	89	+ 693	-72
1966	8,414	258	7,880	115	- 534	-143
1967	8,494	260	8,562	147	+ 68	-113
1968	11,647	412	10,356	198	-1291	-214

Note: Tobacco leaves

Source: Department of Customs

ANNEX 1

TABLE 3

Vegetable Oil Imports and Exports

Thailand

Year	Imports		Exports		Trade Balance	
	Litres	Bahts	Litres	Bahts	Litres	Bahts
1957	624,928	6,015,683	1,062,756	8,564,863	+ 437,828	+ 2,549,180
1958	1,079,493	8,496,350	818,191	6,277,676	- 261,302	- 2,218,674
1959	2,097,240	16,474,335	1,504,430	10,758,045	- 592,810	- 5,716,290
1960	951,197	7,837,450	248,194	1,886,230	- 703,003	- 5,951,220
1961	863,388	7,636,771	1,466,917	11,231,229	+ 603,529	+ 3,594,458
1962	1,680,916	11,944,555	2,416,841	16,925,716	+ 735,925	+ 4,981,161
1963	1,131,250	9,447,728	1,021,406	5,972,445	- 109,844	- 3,475,283
1964	2,979,570	20,779,190	833,942	3,921,658	-2,145,628	-16,847,532
1965	2,306,604	18,618,948	1,255,678	6,835,609	-1,050,926	-11,783,339
1966	1,554,140	13,218,788	2,593,337	12,889,810	+1,039,197	- 328,978
1967	2,439,092	18,667,399	1,377,837	8,711,581	-1,061,255	- 9,955,818
1968	2,580,333	21,271,123	152,386	773,762	-2,427,947	-20,497,361

Source: Department of Customs

Vegetable oil imports are only a small portion of total oil consumption in Thailand which is estimated at 35,000 tons of oil. This figure includes oil of all types.

High tariffs exist to protect Thai oil mills with duty rates on vegetable oils ranging between 33% and 88%. Lard, from pork fat, a major competitor of vegetable oil enjoys a protective tariff of 110%.

The price of vegetable oil and lard to the Thai consumer is higher than the price paid by the consumer in the United States.

Apart from the tarrif, a key reason for the high price of vegetable oil is the shortage of raw materials. The reason for the shortage is because large quantities of raw oilseeds are exported. The competition between oilseed exporters and Thai processing plants tends to drive the price of raw material up. Also exporters are able to buy in large quantities than processers and are thus able to exert pressure to get supplies.

The processing industry is made up of a large number of small mills and two middle-sized establishments. Most larger mills are well under capacity which increases cost per unit.

Source: Investor magazine, January, 1969.

Increased oilseed production should result in an end to vegetable oil imports, and an end to the stiff competition between exporters and processers. The latter should result in cheaper consumer prices of oil and should also make Thai oilseeds more competitive in the export market.

MARKETING APPENDIX

ANNEX 2

BACKUP DATA ON INTERNATIONAL DEMAND

TRADE STATISTICS FOR SELECTED PRODUCTS

FAO - 1968

TABLE 1

Bovine Cattle (inc. buffaloes)
Live - For Selected Asian Countries

Exports by Year (Major Exporters)

Country:	Quantity (100 head) & Value (10,000 U.S. Dollar)					
	1962	1963	1964	1965	1966	1967
Cambodia-Qty.	336	401	302	52	121	-
Value	331	369	223	57	109	-
China-m. Qty.	171	237	461	948	62	1,114
Value	153	214	374	766	51	1,056
Hong Kong Qty.	36	31	36	35	21	21
Value	37	29	33	27	16	18
Japan Qty.	26	21	18	8	7	18
Value	22	20	22	24	43	26
Malaysia Qty.	18	29	30	18	17	3
Value	21	33	33	27	28	4
Mongolia Qty.	1,162	702	744	773	1,030	1,059
Value	1.040	6,330	604	620	842	950
Sigapore Qty.	28	30	21	35	48	57
Value	33	35	24	41	49	61
Thailand Qty.	616	437	670	582	555	505
Value	491	384	555	496	481	448
Total: Qty.	2,393	1,888	2,282	2,451	1,861	2,777
Value	2,108	7,414	1,868	2,058	1,619	2,563
6 year totals: Quantity = 13,652; Total Value = 17,630; Average = $129 *						
Average Value per head =	$88	$390	$82	$82	$87	$92
Average Value per head of Thai export =	$80	$88	$83	$85	$97	$89
Thai Percentage Share of total						
Quantity and Qty:	26%	23%	29%	24%	30%	18%
Value of Exports Value:	23%	5%	30%	24%	30%	17%

* Questionable because of year 1963 - Mongolia -without 1963 Average is $88 per head

TABLE 2
Bovine Cattle - Live

Imports by Year (Major Importers)

Country:	Quantity (100 head) & Value (10,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Hong Kong Qty.	1,253	1,117	1,439	1,683	1,987	1,772
Value	1,179	1,061	1,231	1,421	1,479	1,292
Japan Qty.	8	7	12	16	13	20
Value	57	47	74	96	138	214
Macao Qty.	107	84	92	90	97	70
Value	66	58	61	75	81	57
Malaysia Qty.	92	91	80	93	108	96
Value	116	115	101	117	118	95
Singapore Qty.	106	110	94	113	128	146
Value	101	103	102	121	138	151
Total Qty:	1,566	1,409	1,717	1,995	2,333	2,104
Value	1,519	1,384	1,569	1,830	1,954	1,809
Average Value/head	$97	$98	$92	$92	$90	$90

6 year total Quantity = 11,124 Total Value = 10,065 Average Price = $90.48

TABLE 3
Swine - Live

Exports by Year (Major Asian Exporters)

Country:	Quantity (100 head) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Cambodia Qty.	1,067	126	1	-	-	6
Value	3,423	365	2	-	-	13
China Mnl. Qty.	7,856	12,855	17,173	18,792	19,515	18,160
Value	20,818	32,395	40,870	59,570	64,000	51,938
Taiwan Qty.	561	183	69	57	51	135
Value	1,922	644	241	186	216	606
Hong Kong Qty.	33	39	2	-	-	-
Value	100	119	5	-	-	-
Indonesia Qty.	103	22	36	76	59	3
Value	135	50	70	150	120	4
Japan Qty.	4	2	7	16	3	-
Value	26	42	51	181	53	-
S. Korea Qty.	331	1,150	835	1	-	12
Value	1,474	3,676	1,045	3	-	51
Malaysia Qty.	24	58	139	162	162	36
Value	58	167	164	226	243	57
Singapore Qty.	195	191	455	466	390	188
Value	585	608	1,447	1,445	1,099	509
Thailand Qty.	1,100	591	17	2	131	112
Value	3,319	1,627	20	6	753	437
N. Vietnam Qty.	71	50	125	169	47	16
Value	242	174	434	549	154	50
S. Vietnam Qty.	1,067	50	12	25	-	-
Value	3,423	78	43	95	-	-
Total Qty:	12,412	15,317	18,871	19,766	20,358	18,668
Value	35,525	39,945	44,392	62,411	66,638	53,665
Average Price/head of all countries	$28.50	$26	$23.50	$32	$33	$29
Average Price/head of Thai stock	$30	$27.50	$11,80	$30	$57	$39.50
Export Percent Qty:	9%	4%	-	-	1%	1%
of Thailand Value:	9%	4%	-	-	1%	1%

6 year Totals Quantity = 105,395 Value = 302,570 Average Price/head = $28.70

TABLE 4
Swine - Live

Imports by Year (Major Asian Importers)

Country:	Quantity (100 head) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Brunei Qty.	52	60	57	64	76	-
Value	144	117	188	227	240	-
Hong Kong Qty:	10,303	14,016	16,943	18,292	18,759	17,603
Value	28,814	37,229	42,488	47,195	48,453	38,741
Japan Qty.	6	13	53	2	6	3
Value	256	248	250	206	279	126
Macao Qty.	739	868	913	844	931	932
Value	1,072	1,518	1,684	1,764	1,834	1,530
Malaysia Qty.	147	138	414	418	330	125
Value	454	473	1,368	1,385	1,033	289
Singapore Qty.	95	65	137	169	147	39
Value	221	197	200	274	218	80
Total Qty:	11,342	15,160	18,517	19,789	20,249	18,602
Value	30,961	39,782	46,178	50,951	51,957	40,766
Average Price Per Head - all countries	$27	$26	$25	$26	$26	$22

6 year Totals Quantity = 103,658; Total Value = $260,550 Average Price/Head = $25,13

TABLE 5
Meat of Bovine Animals
Fresh, Chilled, or Frozen

Exports by Year (Major Asian)

Country:	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Hong Kong Qty.	13	5	38	50	36	21
Value	16	8	54	63	31	41
India Qty.	159	150	33	-	-	-
Value	55	60	12	-	-	-
Japan Qty.	13	25	21	51	103	16
Value	41	60	60	70	106	70
Singapore Qty.	448	525	1,039	1.191	1,588	1,264
Value	417	649	937	1,223	1,782	1,372
Thailand Qty.	3	2	13	7	-	-
Value	1	2	6	4	-	-
Total Qty:	636	707	1,144	1,299	1,727	1,301
Value	530	779	1,069	1,360	1,919	1,483

Asian Exports are insignificant relative to the rest of the world. Europe, South America, and Oceania for outstrips Asia. Africa also exports substantially more.

In 1967 Australia exported 262,463 metric tons of beef and New Zealand 106,203 metric tons. They are in a very good position to supply the Asian market.

Average Price Per ton - all countries	$832	$1,100	$930	$1,050	$1,110	$1,140
Average Price Per ton - Thailand	$333	$1,000	$460	$572	-	-
Export Percent Qty.	-	-	1%	1%	-	-
of Thailand Value.	-	-	1%	-	-	-

6 year Totals: Qty. = 6,814; Total Value = 7,140; Average Price/Ton = $1,047.84

TABLE 6
Meat of Bovine Animals
Fresh, Chilled, or Frozen

Imports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars) 1962	1963	1964	1965	1966	1967
Ceylon Qty.	23	14	29	29	79	41
Value	17	11	28	26	69	33
Hong Kong Qty.	1,717	2,763	2,582	2,715	2,890	2,478
Value	1,286	1,986	1,101	2,384	3,104	2,697
Japan Qty.	4,764	4,689	6,200	10,814	13,493	13,793
Value	2,519	2,363	3,669	6,916	10,558	13,577
Macao Qty.	-	64	41	76	-	-
Value	-	26	16	29	-	-
Malaysia Qty.	902	1,165	1,395	1,549	1,860	1,184 *
Value	765	979	1,247	1,570	1,970	1,199 *
Philippine Qty.	1,305	1,803	2,069	1,739	1,733	-
Value	610	944	1,257	1,372	1,448	-
Singapore Qty.	2,978	4,952	4,239	4,727	4,707	4,046
Value	1,923	3,162	3,172	4,018	4,638	3,855
Total Qty.	11,689	15,450	16,555	21,649	24,762	21,542
Value	7,120	9,471	11,590	16,315	21,787	21,361

The areas importing the most are Europe and North America.

Average Price Per Ton - All Asian Countries:	$610	$610	$700	$781	$880	$990

6 year Totals; Qty = 111,647; Value = 87,644 Average Price/Ton = $785.00

* W. Malaysia only

TABLE 7
Meat of swine -
Fresh, Chilled, or Frozen

Exports by Year (Major Asian)

Country:	Quantity (metric tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Taiwan Qty.	-	100	17	10	-	1
Value	-	70	12	7	-	1
Hong Kong Qty.	3	2	6	5	18	37
Value	2	2	8	6	14	30
Japan Qty.	42	11	17	11	13	73
Value	9	1	4	3	5	34
Korea Qty.	46	179	17	-	-	-
Value	18	110	8	-	-	-
Malaysia Qty.	12	7	4	1	-	-
Value	6	3	2	1	-	-
Singapore Qty.	201	136	152	209	267	159
Value	119	125	155	229	319	167
Thailand Qty.	-	1	6	9	-	4
Value	-	1	3	7	-	2
Total Qty:	304	436	219	245	298	274
Value	154	312	192	253	338	234

Asian exports are quite small compared to other regions.

In 1966 and 1967 Australia exported 483 and 934 metric tons of swine meat. New Zealand exported 3,299 and 1,126 metric tons in the same years.

Europe is the largest exporting region by far with North America a distant second.

Average Price Per Ton all Asian Countries:	$505	$715	$920	$1,030	$1,130	$855
Average Price Per ton in Thailand	-	$1,000	$500	$780	-	$500
Export Percent Qty:	-	-	3	4	-	1
Value:	-	-	2	3	-	1

6 year Totals: Quantity 1,776; Value = 1,483; Average Price/Ton = $835

TABLE 8
Meat of Swine
Fresh, Chilled, or Frozen

Imports by Year (Major Asian)

Country:	Quantity (Metric Tons) & Value (1,000 U.S. DOLLARS)					
	1962	1963	1964	1965	1966	1967
Hong Kong Qty.	4,462	4,445	7,242	9,828	13,348	15,096
Value	2,206	1,964	3,900	4,642	6,374	7,507
Japan Qty.	2	6,512	4,015	70	28	1
Value	1	5,486	3,130	59	22	1
Malaysia Qty.	330	258	267	174	248	180
Value	198	198	213	154	261	155
Philippine Qty.&	-	127	250	62	521	-
Value	-	45	92	35	223	-
Singapore Qty.	346	558	606	805	1,007	848
Value	273	449	575	674	751	594
Total Qty:	5,140	11,900	12,380	10,939	15,152	16,719
Value	2,678	8,142	7,910	5,564	7,631	8,257
Average Price Per Ton	$520	$685	$640	$510	$505	$495

Europe and North America are the major importers in the world. Most trade, however, appears to be intraregional.

6 year Total Quantity = 72,230; Value 40,182; Average Price/Ton = $556.30

TABLE 9
Poultry, Killed or Dressed,
Fresh, Chilled, or Frozen

Exports by Year (Major Asian)

Country:	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Hong Kong Qty.	93	142	102	124	34	79
Value	54	74	63	65	20	47
India Qty.	80	16	1	-	1	-
Value	61	14	1	-	-	*
Japan Qty.	11	11	2	3	30	251
Value	11	10	2	1	9	155
Malaysia Qty.	4	2	3	12	-	-
Value	4	3	3	11	-	-
Singapore Qty.	196	453	605	702	767	641
Value	239	466	547	601	648	538
Thailand Qty.	22	-	5	2	-	-
Value	42	-	2	1	-	-
S. Vietnam Qty.	201	327	395	262	3	-
Value	62	86	105	87	1	-
Total Qty:	607	951	1,113	1,105	835	971
Value	549	653	723	766	688	740

Europe dominates chicken exports followed distantly by North America.

Average Price Per Ton:	$905	$688	$640	$690	$820	$760
Average Price Per Ton-Thailand	$1,900	-	$400	$500	-	-
Export Percent Qty:	4%	-	-	-	-	-
Value	8%	-	-	-	-	-

6 year Totals: Quantity = 5,582; Value = 4,116; Average Price/Ton = $737.37

TABLE 10
Poultry, Killed or Dressed
Fresh, Chilled or Frozen

Imports by Year (Major Asian)

Country:	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Ceylon Qty.	69	24	19	3	2	10
Value	59	22	16	3	-	6
Hong Kong Qty.	5,757	5,898	9,728	8,941	9,369	13,371
Value	3,167	3,304	4,737	4,545	4,934	6,787
Japan Qty.	284	3,471	5,936	6,135	7,935	8,400
Value	246	2,550	4,099	4,602	6,044	5,912
Macao Qty.	-	408	309	256	142	188
Value	-	117	89	71	41	49
Malaysia Qty.	328	489	755	976	1,211	366
Value	354	483	662	785	907	256
Philippines Qty.	2	3	9	13	38	-
Value	1	2	6	10	19	-
Singapore Qty.	904	1,891	2,118	2,604	3,194	2,962
Value	772	1,483	1,512	1,816	2,348	1,963

Europe leads all importers followed by Asia

Total Qty:	7,344	12,184	18,874	18,928	21,891	25,297
Total Value:	4,599	7,961	11,121	11,832	14,293	14,973
Average Value Per Ton	$626	$653	$589	$625	$653	$592

6 year Total: Qty = 104,518 Value = 64,779 Average Price/Ton = $619.78

TABLE 11

Canned Meat

Exports by Year (Major Asian)

Country	Quantity (Metric Tons)			Value (1,000 U.S. Dollars)		
	1962	1963	1964	1965	1966	1967
China Mnl. Qty.	6012	8330	23945	39332	41778	20705
Value	5632	7360	24570	50760	46085	23020
Hong Kong Qty.	369	271	995	424	590	509
Value	369	232	688	356	509	447
India Qty.	58	49	98	16	15	18
Value	261	242	542	52	51	59
Japan Qty.	689	656	777	930	854	948
Value	602	598	1058	1620	967	971
Malaysia Qty.	43	20	24	28	94	150
Value	40	27	26	53	101	216
Singapore Qty.	1533	1888	1628	1643	1646	2261
Value	1520	1905	1724	1763	1688	2030
Thailand Qty.	64	29	16	2	3	-
Value	43	26	17	2	4	-

Europe and South America are the leading exporting regions. Historically Austratian and New Zealand exports surpass those of Asia.

Total Qty:	8768	11243	27483	42375	44980	24591
Total Value:	8467	10390	28625	54606	49405	26743
Average Value Per Ton:	$966	$924	$1,042	$1,289	$1,098	$1,008
Thai Average Value Per Ton:	$672	$897	$1,063	$1,000	$1,333	-
6 year Totals: Quantity 159,440; Value $178,236; Average Price Per Ton $1,118.00						
Export Percent Qty:	1%	-	-	-	-	-
of Thailand Value:	1%	-	-	-	-	-

TABLE 12

Canned Meat

Imports by Year (Major Asian)

Country:	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Ceylon Qty.	284	665	215	224	313	128
Value	385	224	338	350	384	159
Hong Kong Qty.	3436	3721	6977	7522	7411	10884
Value	2571	2793	4360	5105	5649	7617
Japan Qty.	195	410	433	618	688	819
Value	200	388	422	875	756	906
Korea Qty.	184	-	28	208	219	144
Value	137	-	18	196	103	146
Laos Qty.	182	150	705	413	40	-
Value	84	117	219	145	49	-
Macao Qty.	17	248	247	375	558	530
Value	16	206	240	330	546	463
Malaysia Qty.	2938	3659	5344	6719	6379	4663 *
Value	4186	4617	5416	6283	6425	4210 *
Philippines Qty.	9227	5782	249	6798	5693	UNK
Value	6867	3660	80	4412	3815	UNK
Singapore Qty.	3205	3507	4257	4503	4311	5496
Value	3738	4198	4564	4772	5017	5206
Thailand Qty.	44	95	83	59	82	132
Value	110	224	209	168	299	268
S. Vietnam: Qty.	87	11	76	47	500	154
Value	112	16	58	49	595	173
Europe is the largest importer followed by North and Central America.						
* does not include Sabah and Sarawak-the other numbers do include them.						
Total Qty:	19799	18248	18614	27486	26184	22950
Total Value:	18406	16443	15924	22685	23638	19148
Average Value Per Ton:	$930	$901	$855	$866	$903	$834
Average Thai Price/Ton:	$2,500	$2,358	$2,518	$2,847	$3,646	$2,030
Thai Percentage Share:	1%	-	-	-	-	1%

TABLE 13

Rice

Exports by Year (major Asian)

Country:	Quantity (100 Metric Tons) & Value (10,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Burma Qty.	16904	16850	13944	13475	11000	5441
Value	16713	17018	14741	15510	11900	8620
Cambodia Qty.	1312	3779	4914	4729	1657	2229
Value	1298	4352	5752	5305	2248	3533
China Mnl. Qty.	5778	6397	7845	7505	12096	10710
Value	7563	8480	8770	8380	14902	16980
Taiwan Qty.	512	1199	1275	2573	1777	1159
Value	739	1787	1996	4099	2972	2001
Hong Kong Qty.	667	228	536	293	287	74
Value	785	265	614	333	364	120
S. Korea Qty.	597	51	133	190	399	-
Value	893	78	235	324	684	-
N. Korea Qty.	3	-	-	435	721	1254
Value	4	-	-	486	912	1970
Malaysia Qty.	226	98	70	365	323	101
Value	318	140	101	501	457	144
Singapore Qty.	1878	2234	1087	991	1065	795
Value	2596	2866	1446	1306	1440	1364
Thailand Qty.	12710	14176	18963	18952	15076	14860
Value	15525	16304	21099	20838	19236	22414

Vietnamese exports were significant until recently and could be significant in the future.

Total rice exports have been falling over the 1962-1967 period.

Total Qty:	40587	45012	48767	49508	44401	36614
Total Value:	46434	51290	54754	57082	55115	57146
Average Value Per Ton	$114	$114	$112	$115	$124	$156
Thai Percentage Share:						
Qty.	31%	31%	39%	38%	34%	41%
Value:	32%	32%	39%	37%	35%	39%
Average Thai Price/Ton:	$122	$115	$111	$110	$128	$151

TABLE 14

Rice

Imports by Year (Major Asian)

Country:	Quantity (100 Metric Tons)			Value (10ϕ,000 U.S. Dollars)		
	1962	1963	1964	1965	1966	1967
Ceylon Qty.	4107	4029	6853	5300	6932	3547
Value	4096	4040	6853	5753	7704	4324
Hong Kong Qty.	4267	4119	4111	3703	3666	4208
Value	5670	5595	5276	4796	5270	8188
India Qty.	4267	4119	4111	3703	3666	4208
Value	4013	4675	7026	9408	10026	7017
Indonesia Qty.	10961	10753	10255	2000	2690	3470
Value	12583	11119	12562	2412	3432	5320
Japan Qty.	1778	2220	4151	9673	8117	5094
Value	2382	2874	5835	14471	13130	8350
S. Korea Qty.	-	1172	-	-	180	1390
Value	-	1753	-	-	309	2490
Laos Qty.	431	382	419	413	409	180
Value	444	433	380	388	1015	300
Macao Qty.	231	221	210	199	193	185
Value	220	212	210	188	184	162
Malaysia Qty.	3924	4773	5069	3879	3364	3907
Value	5433	6572	6281	4820	4789	6679
Philippine Qty.	-	2560	2989	5596	1049	2905
Value	-	3873	3458	6074	1332	4380
Singapore Qty.	3495	4399	2703	2910	2615	2563
Value	4733	5580	3446	3623	3747	4551
S. Vietnam Qty.	415	-	-	4750	4750	7500
Value	684	-	-	7838	7838	13338

Asian countries account for well over 50% of total world rice imports. There are few countries outside Asia with significant imports.

Total Qty.:	33876	38747	40871	42126	37631	39157
Total Value:	40258	46726	51327	59771	58776	65099
Average Value Per Ton:	$119	$121	$126	$142	$156	$166

TABLE 15

Unmilled Maize (Corn)

Exports by Year (Major Asian))

Country:	Quantity (100 Metric Tons) & Value (100,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Burama Qty.	232	215	85	285	125	UNK
Value	112	104	48	82	72	UNK
Cambodia Qty.	1344	1149	1485	816	1333	UNK
Value	788	688	811	509	815	UNK
China Mnl. Qty.	8	1096	1696	2445	1463	752
Value	4	557	1007	1252	887	480
Singapore Qty.	254	268	139	109	94	120
Value	169	181	93	81	67	81
Thailand Qty.	4724	7440	11577	8044	12185	10908
Value	2415	3991	6546	4657	7307	6517

North America accounts for over 50% of world corn exports. It is followed by Europe and South America. Individual countries with large exports are the USA, Argentina, Mexico, Romania, France, and South Africa.

Total Qty:	6562	10168	14982	11699	15200	11780
Total Value:	3488	5521	8505	6581	9148	7078
Average Value Per Ton	$53	$54	$57	$56	$60	$60
Export Percent Qty:	72	73	77	69	80	93
of Thailand Value:	69	72	77	71	80	92
Average Price/Ton in Thailand	$51	$54	$57	$58	$60	$60

TABLE 16

Unmilled Maize (Corn)

Imports by Year (Major Asian)

Country:	Quantity (100 Metric Tons)			Value (10,000 U.S. Dollars)		
	1962	1963	1964	1965	1966	1967
China Mnl. Qty.	4912	134	3772	718	202	1365
Value	3001	84	2705	488	144	960
Taiwan Qty.	22	59	86	563	648	1336
Value	14	37	124	406	419	893
Hong Kong Qty.	1239	1215	921	738	931	928
Value	683	696	542	473	579	564
India Qty.	875	610	1186	1750	127	599
Value	516	383	834	1199	91	425
Japan Qty.	23162	26455	32290	34335	35977	39602
Value	13375	15846	20869	23148	24330	27098
S. Korea Qty.	227	163	107	7	29	111
Value	159	113	54	5	27	87
Malaysia Qty.	841	922	662	527	703	619
Value	549	600	435	364	473	410
Singapore Qty.	1438	1339	91	105	159	43
Value	855	802	56	69	103	31

Europe is the major importing region followed by Asia. Major importers are Italy, Japan, Yugoslavia, Spain, West Germany, and the Natherlands.

Total Qty:	32716	30897	39115	39071	38776	44603
Total Value:	19152	18561	25619	26152	26166	30468
Average Value Per Ton ($):	$59	$60	$65	$67	$67	$68

TABLE 17

All Oilseed Cake and Meal
Exports by Year (Major Asian)

Country:	Quantity (10 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Burma Qty.	26729	28025	20806	19229	10300	11400
Value	17929	19274	22423	10029	6940	7550
Ceylon Qty.	1117	373	1754	981	29	4
Value	687	265	1010	674	10	1
China Mnl. Qty.	453	919	1936	2932	2599	3158
Value	356	580	1350	2180	2190	2090
India Qty.	72748	90899	95782	118657	83897	73679
Value	56837	71484	78057	79554	70521	60245
Indonesia Qty.	7615	9376	15730	12580	14280	16530
Value	3394	4088	4380	5400	5000	5900
Japan Qty.	1479	1894	1073	69	461	3331
Value	1026	1157	677	77	482	2091
Pakistan Qty.	5342	5109	4145	4707	7148	7433
Value	2649	3059	2452	3088	4717	4962
Philippine Qty.	14087	16828	19312	18493	23485	20030
Value	8742	12400	12063	12118	16817	12500
Singapore Qty.	2122	1563	904	961	852	2942
Value	1768	1274	769	807	792	1986
Thailand Qty.	1819	2096	2974	2680	2832	1660
Value	1352	1269	2122	2055	2186	1209
Total Qty:	133511	157082	164416	181289	145883	140167
Total Value:	94470	114850	115303	115982	109655	99534
Average Val. Per Ton	$71	$73	$70	$64	$75	$71
Export Percent Qty:	1%	1	2	1	2	1
of Thailand Value:	1%	1	2	2	2	1
Average Price/Ton in Thailand	$74	$61	$71	$77	$77	$73

TABLE 19

Soybean Cake and Meal

Exports by Year (Major Asian)

Country:	Quantity (10 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Japan Qty:	19	41	4	46	261	292
Value	23	49	5	57	318	348
Thailand Qty.	33	468	872	195	289	247
Value	29	363	648	147	247	221

North America accounts for the bulk of world exports.

Total Qty.	52	509	876	241	550	539
Total Value	52	412	653	204	565	569
Average Value Per Ton	$100	$81	$75	$85	$103	$106
Export Percent Qty.	63	92	100	81	53	46
of Thailand Value	56	88	99	72	44	39
Average Price/Ton: in Thailand	$88	$78	$74	$75	$85	$89

TABLE 20

Soybean Cake and Meal

Imports by Year (Major Asian)

Country:	Quantity (10 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Japan Qty:	1582	151	1326	4632	741	228
Value	1422	177	1464	4872	792	261
Philippine Qty.	1104	514	644	625	533	3460
Value	979	480	615	612	603	3500
Europe absorbs over 90% of total world imports.						
Total Qty.	2686	665	1970	5257	1274	3688
Total Value.	2401	657	2079	5484	1395	3761
Average Value Per Ton ($)	$89	$99	$106	$104	$109	$102

TABLE 21

Cottonseed Cake and Meal

Exports by Year (Major Asian)

Country.	Quantity (10 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Burma Qty.	1489	1048	960	846	500	500
Value	1047	724	647	634	340	350
India Qty.	2601	6986	7949	10459	13396	13786
Value	1769	4524	5511	7868	8844	9793
Pakistan Qty.	1497	1680	2075	1700	3736	3908
Value	958	1202	1478	1114	2510	2703

Major exporting countries are Turkey, India, the Sudan, Syria, Uganda, and Argentina.

Total Qty.	5587	9714	10984	13005	17632	18194
Total Value:	3774	6450	7636	9616	11694	12846
Average Value Per Ton: ($)	$68	$66	$70	$74	$66	$71

TABLE 22

Cottonseed Cake and Meal

Imports by Year (Major Asian)

Country	Quantity (1000 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Japan Qty.	-	1249	474	310	1019	322
Value	-	1117	431	259	850	207

Europe accounts for almost all of the world imports. The largest European importers are Denmark, Great Britain, West Germany and Sweden.

Total Qty.	-	1249	474	310	1019	322
Total Value.	-	1117	431	259	850	207
Average Value Per Ton: ($)	-	$89	$91	$84	$83	$64

TABLE 23

Tobacco, Unmanufactured

Exports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (10,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Cambodia Qty.	-	391	272	147	73	UNK
Value	-	4	3	10	6	UNK
Ceylon Qty.	174	82	-	-	-	427
Value	15	10	-	-	-	58
China Mnl. Qty.	3695	13936	4708	4555	7586	11427
Value	162	836	270	300	630	1010
Taiwan Qty.	3857	1351	1867	2777	4876	2648
Value	188	88	97	176	285	137
India Qty.	63453	67898	71711	61950	35611	55739
Value	3929	4776	4698	4550	2788	4361
Indonesia Qty.	11500	12900	19500	13100	12400	10200
Value	1616	1893	2182	1737	2379	1500
Japan Qty.	7498	6941	6952	7269	8872	5889
Value	692	721	783	862	1082	717
N. Korea Qty.	10305	7745	3700	8100	5100	1793
Value	452	465	212	518	422	160
S. Korea Qty.	101	305	373	1350	9958	10847
Value	7	20	14	85	647	664
Philippine Qty.	24142	24770	33431	24571	22146	24029
Value	1175	1385	1813	1359	1068	1310
Singapore Qty.	1176	1487	659	735	929	688
Value	105	131	83	76	78	67
Thailand Qty.	2628	3782	5695	6172	7880	8562
Value	146	197	369	446	553	708
North America is the leading export region followed by Europe and Asia.						
Total Qty.	128529	141588	148868	130726	115431	132449
Total Value.	8487	10526	10524	10119	9938	10692
Export Percent Qty.	2%	3	4	5	7	6
of Thailand: Value:	2%	2	4	4	6	7
Average Price/Ton:	$556	$521	$648	$723	$702	$827
in Thailand						
Average Price/Ton	$660	743	707	774	861	807
of Total.						

TABLE 24

Tobacco, Unmanufactured

Imports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (100,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Ceylon Qty.	1647	1167	616	748	497	138
Value	122	133	68	59	72	17
Taiwan Qty.	1594	2201	1170	1939	2168	6276
Value	295	403	233	352	446	1114
Hong Kong Qty.	8852	8316	8498	8210	7047	6962
Value	839	879	877	841	751	693
India Qty.	1076	551	764	79	93	700
Value	268	136	170	3	3	208
Japan Qty.	17509	15824	29091	24958	32081	29610
Value	3227	3068	4709	4465	6153	5688
Laos Qty.	438	702	585	1078	752	UNK
Value	18	46	36	85	69	UNK
Malaysia Qty	4511	5561	4049	5200	5957	5038
Value	598	707	580	714	811	750
Philippine Qty.	1166	2265	514	903	1740	2720
Value	145	116	65	83	198	300
Singapore Qty.	4019	4153	3406	4199	3634	3864
Value	461	521	453	532	456	521
Thailand Qty.	3875	3673	4960	5619	8833	9309
Value	603	576	780	824	1300	1382
S. Vietnam Qty.	2581	2503	2589	4813	3935	5242
Value	394	418	415	755	696	1028

Europe accounts for roughly 60% of total world imports followed by North America and Asia. Australia imports around 12,000 tons annually and New Zealand 3,000 tons.

Total Qty.	47268	46916	56179	58376	66737	59859
Total Value.	6970	7003	7756	8713	10955	11701
Average Value Per Ton.	$1475	$1493	$1381	$1492	$1642	$1955
Thai Import Qty.	8%	8%	9%	10%	13%	16%
Share Percent Value	9%	8%	10%	10%	12%	12%
Average Price Per Ton in Thailand:	$1556	$1568	$1573	$1466	$1472	$1485

TABLE 25

Soybeans

Exports by Year (Major Asian)

Country	Quantity (10 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Cambodia Qty.	352	665	407	851	67	270
Value	228	487	362	954	87	350
China Mnl. Qty.	34218	33210	49841	57616	55010	56441
Value	43490	43540	61200	76745	71625	72200
Hong Kong Qty.	896	541	223	576	846	402
Value	986	646	307	771	918	485
Laos Qty.	6	10	2	4	2	UNK
Value	7	14	1	3	1	UNK
Singapore Qty.	653	730	747	811	706	855
Value	819	906	907	1089	890	1026
Thailand Qty.	191	440	432	161	561	590
Value	239	486	450	217	703	727

The U.S.A. accounts for 85% to 90% of total world exports.

Total Qty.	36316	35596	51652	59983	57192	58558
Total Value.	45769	46079	63227	79779	74251	74788
Average Value Per Ton: ($)	$126	$129	$122	$133	$130	$128
Export Percent Qty.	1%	1	1	-	1	1
of Thailand Value.	1%	1	1	-	1	1
Average Price/Ton in Thailand	$125	$106	$104	$135	$125	$123

TABLE 26

Soybeans

Imports by Year (Major Asian)

Country	Quantity (10 Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Taiwan Qty.	6243	18246	18183	16140	16450	35114
Value	6941	19702	20452	19217	19761	43284
Hong Kong Qty.	2088	1870	1249	327	2033	2201
Value	2250	1998	1378	375	2139	2648
Japan Qty.	129311	154436	160715	184747	216847	216980
Value	132709	167946	184524	225774	272007	272038
S. Korea Qty.	2006	816	817	19	15	2576
Value	2180	883	1055	49	12	3231
Malaysia Qty.	1802	1690	1883	1813	1807	1769
Value	2152	2021	2302	2472	2406	2279
Philippine Qty.	13	547	227	1992	2265	UNK
Value	13	549	241	2316	2267	UNK
Singapore Qty.	1712	1927	1558	1999	1266	1436
Value	1822	2107	1695	2463	1653	1936

Europe accounts for roughly 60% of total world imports and Asia between 30% and 35%

Total Qty.	143175	179532	184632	207037	240683	260076
Total Value	148067	195206	211647	252726	300245	325416
Average Value Per Ton ($):	$103	$109	$115	$122	$125	$125

TABLE 27

Cotton Seed

Exports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Cambodia Qty.	11904	2642	1610	2573	3295	UNK
Value	358	76	62	98	143	UNK
Hong Kong Qty.	10569	3951	160	239	875	406
Value	603	247	9	10	53	30
Pakistan Qty.	655	-	543	351	460	429
Value	68	-	49	36	43	33
Thailand Qty.	9200	11235	14764	8903	17664	30666
Value	382	505	598	415	973	2127

The largest exporters in the world are Nicaragua, Nigeria, the Sudan, Thailand, and Afghanistan. Regionally Africa exports the most followed by North & Central America, and Asia.

Total Qty.	32328	17828	17077	12066	22294	31501
Total Value.	1411	828	718	559	1212	2190
Avg. Val. Per Ton ($)	$44	$46	$42	$46	$54	$70
Export Percent Qty.	28	63	86	74	79	97
of Thailand Value.	27	61	83	74	80	97
Average Price/Ton: in Thailand	$42	$45	$41	$47	$55	$69

TABLE 28

Cotton Seed

Imports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Hong Kong Qty.	10272	3869	369	53	2101	406
Value	546	207	18	4	104	28
India Qty.	27	47	16	6	6	-
Value	9	13	5	2	2	-
Japan Qty.	150064	168181	205540	217069	265783	216213
Value	11865	12483	15108	17148	23599	19696
Pakistan Qty.	-	-	-	4779	-	1638
Value	-	-	-	411	-	150

Asia is the largest importer due to Japan. Europe imports some but Asia accounts for 75% to 80% of total imports.

Total Qty.	177518	172097	205925	221907	267890	218257
Total Value	12420	12703	15131	17505	23705	19874
Avg. Val. Per Ton ($)	$70	$74	$73	$79	$88	$91

TABLE 29

Silk

Exports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
China Mnl. Qty.	1088	1234	1816	3338	5989	5743
Value	5205	7094	9744	15310	30750	29300
Hong Kong Qty.	54	72	84	140	228	69
Value	415	411	160	729	780	267
India Qty.	758	606	383	598	847	236
Value	1279	951	580	801	1129	323
Japan Qty.	5782	3951	3201	1961	941	964
Value	56970	50861	29468	15357	10022	6109
N. Korea Qty.	259	214	445	500	513	312
Value	1239	1229	2385	2293	2635	1600
S. Korea Qty.	539	515	634	734	1068	1371
Value	4248	5109	5994	7426	12486	16590
Thailand Qty.	10	19	20	20	11	40
Value	18	28	50	71	45	27
Total Qty.	8490	6611	6585	7291	9597	8735
Total Value	70462	65683	48381	41987	57847	54216

Asia accounts for roughly 70% of total world silk exports. Europe and the USSR make up the rest of the exports. USSR, Italy, and West Germany are the largest non-Asian producers. Thailand is generally in the bottom 1/3, in terms of export volume, of all exporters in the world.

Average Value Per Ton:	$8300	$9935	$7347	$5758	$6027	$6206
Thai Average Value Per Ton:	$1800	$1473	$2500	$3550	$4090	$675
Export Percent Qty.	-	-	-	-	-	-
of Thailand Value:	-	-	-	-	-	-

TABLE 30

Silk

Imports by Year (Major Asian)

Country	Quantity (Metric Tons) &			Value (1,000 U.S. Dollars)		
	1962	1963	1964	1965	1966	1967
Burma Qty.	62	86	106	145	UNK	UNK
Value	773	1447	1282	1628	UNK	UNK
Cambodia Qty.	77	67	56	38	49	UNK
Value	868	988	641	430	594	UNK
Hong Kong Qty.	200	143	182	207	168	82
Value	1474	1760	1184	1316	1369	898
India Qty.	106	132	67	85	72	39
Value	1227	2038	851	1024	723	696
Japan Qty.	570	951	1026	2610	4804	4784
Value	835	2666	3306	9150	25843	37618
S. Korea Qty.	41	44	-	-	25	115
Value	50	56	-	-	68	318
Philippine Qty.	1	2	1	1	2	UNK
Value	2	20	9	9	5	UNK
Total Qty.	1057	1425	1438	3086	5120	5020
Total Value	5229	8975	7273	13557	28602	39530

Total world imports in 1967 were 15036 metric tons of which Italy absorbed roughly 1/3. Apart from Italy and Japan other importers of over 100 tons in 1967 were USA, West Germany, France, Switzerland, Britain, Hungary, and South Korea.

Average Value Per Ton:	$4947	$6298	$5057	$4393	$5586	$7874

TABLE 31

Raw Cotton

Exports by Year (Major Asian)

Country	Quantity (10 Metric Tons) & Value (10,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Burma Qty.	2001	1214	1133	1603	447	350
Value	898	545	566	846	241	161
Cambodia Qty.	375	186	-	-	-	-
Value	129	61	-	-	-	-
China Mnl. Qty.	820	-	3	-	-	381
Value	415	-	2	-	-	210
India Qty.	4994	6580	5098	4122	2669	4386
Value	2509	2643	2403	2247	1410	1892
Japan Qty.	67	90	148	129	153	277
Value	39	56	93	83	80	146
Laos Qty.	4	3	-	1	-	-
Value	-	-	-	-	-	-
Pakistan Qty.	7676	14189	16552	12402	8895	13446
Value	3932	6886	7309	6452	4169	6099
Singapore Qty.	38	67	138	256	357	476
Value	21	31	67	136	189	242
Thailand Qty.	-	22	-	-	14	2
Value	-	9	-	-	8	1
Total Qty.	15975	23707	23072	18513	12535	19318
Total Value	7951	10231	10440	9764	6097	8751

North America leads all region in cotton exports followed by Africa, Asia, The USSR, and South America.

Average Value Per 10 Metric Tons.	$4977	$4315	$4525	$5274	$4864	$4530
Average Value Per Thai 10 Metric Tons.	-	$4090	-	-	$5714	$5000
Export Percent Qty.	-	-	-	-	-	-
of Thailand Value.	-	-	-	-	-	-

TABLE 32

Raw Cotton

Imports by Year (Major Asian)

Country	Quantity (10 Metric Tons) & Value (10,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
China Mnl. Qty.	6749	14314	10523	16850	10702	8817
Value	3707	8329	6100	9900	5940	4780
Taiwan Qty.	4921	6634	5447	6463	7040	8763
Value	2882	4008	3105	3617	3816	4456
Hong Kong Qty.	10523	12404	13188	13352	15190	14283
Value	5985	6942	7413	7366	8067	7285
India Qty.	15593	11275	14287	12361	7884	15199
Value	12181	9018	11781	10874	7143	12490
Japan Qty.	60222	70731	69179	70227	70401	75347
Value	37670	43435	43203	43304	41385	43235
N. Korea Qty.	1080	998	950	1065	1094	1107
Value	593	581	551	626	608	610
S. Korea Qty.	6241	6477	6410	7068	7412	9076
Value	3418	3815	3729	4084	4277	4933
Malaysia Qty.	8	33	138	250	355	UNK
Value	5	15	67	133	187	UNK
Philippine Qty.	4055	3764	2946	2505	4249	3254
Value	2348	2114	1627	1578	2327	1786
Singapore Qty.	29	19	130	228	366	481
Value	18	10	75	131	196	245
Thailand Qty.	774	925	1040	2471	2421	2472
Value	473	536	596	1402	1420	1334
S. Vietnam Qty.	913	820	1588	1727	1358	1128
Value	633	556	1093	1189	1024	1031
Total Qty.	111108	128394	125826	134567	128472	139927
Total Value	69913	79359	79340	84204	76390	82185
Average Val. per 10 Metric Tons.	$6292	$6180	$6305	$6257	$5946	$5873
Average Thai Value 10 Metric Tons.	$6111	$5795	$5730	$5674	$5865	$5396

TABLE 33

Cottonseed Oil

Exports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
China Mnl. Qty.	-	-	-	22191	43552	28563
Value	-	-	-	6800	12550	7820
Hong Kong Qty.	-	-	-	20	692	255
Value	-	-	-	6	199	68
Japan Qty.	69	18	8	35	25	17
Value	21	8	5	16	12	9
Singapore Qty.	25	2	18	2	2	101
Value	9	2	9	2	1	29
Total Qty.	94	20	26	22248	44271	28936
Total Value	30	10	14	6824	12762	7926

The major exporting region is North and Central America followed by Asia and Africa.

Average Value Per Ton.	$319	$500	$538	$307	$288	$274

TABLE 34

Cottonseed oil

Imports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Hong Kong Qty.	8	17	22	620	1145	416
Value	4	8	10	171	318	127
India Qty.	1195	3	-	4928	-	-
Value	372	1	-	1534	-	-
Japan Qty.	3666	7443	12253	2119	4369	2526
Value	1355	2385	3680	729	1428	851
S. Korea Qty.	302	-	16	-	26	20
Value	122	-	7	-	12	19
Malaysia Qty.	33	36	18	515	605	-
Value	14	20	9	142	166	0
Pakistan Qty.	18493	12911	13063	9378	9600	2
Value	7015	3668	3987	3586	3006	1
Philippine Qty.	423	211	1228	1063	51	UNK
Value	152	63	220	192	7	UNK
Singapore Qty.	6	2	21	645	794	514
Value	3	1	10	188	226	135
S. Vietnam Qty.	776	2491	3008	1719	UNK	UNK
Value	333	770	1259	724	UNK	UNK

The UAR is a major importer of cottonseed oil followed by Venzuela, the United Kingdom, Canada, and Costa Rica.

Total Qty.	24902	23114	29629	20987	16590	3478
Total Value	9370	6916	9182	7266	5163	1135
Average Value per Ton:	$376	$299	$310	$346	$311	$326

TABLE 35

Soybean Oil

Exports by Year (Major Asian)

Country	Quantity (Metric Tons) & Value (1,000 U.S. Dollars)					
	1962	1963	1964	1965	1966	1967
Cambodia Qty.	-	138	139	51	-	-
Value	-	11	12	6	-	-
China Mnl. Qty.	1016	2540	2500	3000	4000	3000
Value	325	726	710	920	1220	930
Taiwan Qty.	-	7	352	771	119	273
Value	-	2	108	240	38	89
Hong Kong Qty.	606	511	1138	2380	108	57
Value	191	142	299	757	35	17
Japan Qty.	8115	2811	4524	5580	4716	5020
Value	2458	827	1270	1646	1344	1407
Philippine Qty.	-	500	2125	-	811	UNK
Value	-	106	431	-	189	UNK
Singapore Qty.	16	74	35	17	123	213
Value	6	23	10	4	48	62
Total Qty.	9753	6581	10813	11799	9877	8563
Total Value.	2980	1837	2840	3573	2874	2505

North America accounts for roughly 80% of world exports.

Average Value per Ton.	$305	$279	$263	$303	$291	$293

TABLE 36

Soybean Oil

Imports by Year (Major Asian)

Country	Quantity (Metric Tons) &			Value (1,000 U.S. Dollars)		
	1962	1963	1964	1965	1966	1967
Burma Qty.	-	-	42600	1021	34500	13500
Value	-	-	11100	339	11500	4400
Ceylon Qty.	-	-	-	-	27	408
Value	-	-	-	-	14	217
Taiwan Qty.	3359	999	7510	1003	1250	4743
Value	1016	308	1864	231	226	1565
Hong Kong Qty.	31713	14989	26953	14253	1836	4382
Value	9047	3844	6691	4303	563	1240
India Qty.	1220	138	406	40504	33007	51587
Value	479	45	97	12295	11701	20488
Japan Qty.	337	1316	501	510	134	109
Value	109	344	97	143	41	34
S. Korea Qty.	233	167	85	4	206	29
Value	75	114	30	2	89	10
Malaysia Qty.	47	75	66	62	289	188
Value	16	26	21	20	106	60
Pakistan Qty.	59900	98431	76136	91049	23620	34822
Value	21000	29296	21440	30323	7330	10546
Philippine Qty.	347	311	220	66	576	UNK
Value	91	69	50	13	127	UNK
Singapore Qty.	28	10	2	88	171	176
Value	9	3	1	31	77	75
Thailand Qty.	2	8	28	102	47	92
Value	1	3	1	31	77	75
S. Vietnam Qty.	450	2614	789	1476	11123	14580
Value	168	750	226	604	4579	5500
Total Qty.	97636	119058	155296	150138	106786	124616
Total Value.	32011	34802	41618	48335	36430	44210

TABLE 36 (Continued)

Asia (including Iran and Israel), is the largest importer (about 33%) followed by Europe (30%), Africa, and South America.

	1962	1963	1964	1965	1966	1967
Average Value Per Ton.	$328	$292	$268	$322	$341	$355
Average Price/Ton. in Thailand	$500	$375	$36	$304	$1638	$815
Import Percent Qty.	-	-	-	-	-	-
of Thailand Value	-	-	-	-	-	-

WORLD TRADE DATA

FOREST PRODUCTS

The following tables show exports (Exp.) by region and imports (Imp.). The surplus or deficit (sur-def) for the region is also shown. A plus sign indicates a regional surplus while a minus sign indicates a regional deficits.

WORLD TRADE DATA - FOREST PRODUCTS
CONIFEROUS LOGS, (Million Cubic Meters)

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	1.89	10.04	13.49	17.20	19.63
Imp.	2.58	9.58	12.30	17.39	19.92
Sur-def:	-.69	+.46	+1.19	-.19	-.29
North America Exp.	0.65	4.81	6.42	9.23	11.60
Imp.	0.85	1.33	1.24	1.30	1.45
Sur-def:	-.20	+3.48	+5.18	+7.93	+10.15
Europe Exp.	0.83	1.25	1.60	1.75	1.52
Imp.	1.33	2.75	3.09	3.25	3.13
Sur-def:	-.50	-1.50	-1.49	-1.50	-1.16
USSR Exp.	0.34	3.47	4.79	4.81	4.93
Imp.	-	-	-	-	-
Sur-def:	+0.34	+3.47	+4.79	+4.81	+4.93
Far East Exp.	-	-	-	-	-
Imp.	0.20	5.37	7.82	12.71	15.20
Sur-def:	-0.20	-5.37	-7.82	-12.71	-15.20
Oceania Exp.	-	0.37	0.55	0.80	0.95
Imp.	-	-	-	-	-
Sur-def:	-	+0.37	+0.55	+0.80	+0.95
Other Exp.	0.07	0.14	0.13	0.61	0.63
Imp.	0.20	0.13	0.15	0.13	0.14
Sur-def:	-0.13	+0.01	-0.02	+0.48	+0.49

WORLD TRADE DATA

FOREST PRODUCTS

BROADLEAVED LOGS - Million Cubic Meters

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	7.70	19.13	22.25	24.67	25.68
Imp.	7.30	18.61	23.91	26.20	27.50
Sur-def:	+0.40	+0.52	-1.66	-1.53	-1.82
North America Exp.	-	-	-	-	-
Imp.	0.50	0.42	0.53	-.59	0.50
Sur-def:	-0.50	-0.42	-0.53	0.59	-0.50
Europe Exp.	0.71	0.97	1.11	1.23	1.33
Imp.	3.40	6.54	6.58	6.69	7.50
Sur-def:	-2.69	-5.57	-5.47	-5.46	-6.17
Far East Exp.	3.50	11.91	14.69	16.98	17.30
Imp.	2.74	10.81	15.72	18.06	18.60
Sur-def:	+0.76	+1.10	-1.03	-1.08	-1.30
Africa Exp.	2.72	5.22	5.11	5.11	5.65
Imp.	-	-	-	-	-
Sur-def:	+2.72	+5.22	+5.11	+5.11	+5.65
Others Exp.	0.77	1.03	1.34	1,35	1.40
Imp.	0.66	0.84	1.08	0.86	0.90
Sur-def:	+0.11	+0.19	+0.26	+0.49	+0.50

WORLD TRADE DATA

FOREST PRODUCTS

PULPWOOD - Million Cubic Meters

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	10.59	12.91	14.24	14.77	15.01
Imp.	10.53	12.56	12.88	13.63	13.80
Sur-def:	+0.06	+0.35	+1.36	+1.14	+1.21
North America Exp.	4.66	3.15	3.52	3.07	2.68
Imp.	4.23	2.25	1.98	1.86	1.64
Sur-def:	+0.43	+0.90	+1.54	+1.21	+1.04
Europe Exp.	5.35	5.54	4.93	5.80	6.30
Imp.	5.94	9.70	9.89	10.74	11.05
Sur-def:	-0.59	-4.16	-4.96	-4.94	-4.75
USSR Exp.	0.56	3.91	5.47	5.51	5.60
Imp.	-	-	-	-	-
Sur-def:	+0.56	+3.91	+5.47	+5.51	+5.60
Far East Exp.	-	-	-	-	-
Imp.	-	0.56	0.96	0.97	1.05
Sur-def:	-	-0.56	-0.96	-0.97	-1.05
Other Exp.	0.02	0.31	0.32	0.39	0.43
Imp.	0.36	0.05	0.05	0.06	0.06
Sur-def:	-0.34	+0.26	+0.27	+0.33	+0.37

WORLD TRADE DATA - FOREST PRODUCTS

PAPER AND PAPERBOARD - Million Tons

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	3.29	6.70	8.33	8.75	10.01
Imp.	3.22	6.47	8.01	8.60	9.88
Sur-def:	+0.07	+0.23	+0.32	+0.15	+0.13
North America Exp.	0.62	1.52	2.01	2.23	2.67
Imp.	0.27	0.30	0.42	0.42	0.41
Sur-def:	+0.35	+1.22	+1.59	+1.81	+2.26
Europe Ex.	2.51	4.80	5.68	5.85	6.56
Imp.	1.66	4.43	5.39	5.70	6.62
Sur-def:	+0.83	+0.37	+0.29	+0.15	-0.06
Far East Exp.	-	-	-	-	-
Imp.	0.33	0.45	0.55	064	0.74
Sur-def:	-0.33	-0.45	-0.55	-0.64	-0.74
Latin America Exp.	-	-	-	-	-
Imp.	0.33	0.38	0.57	0.56	0.60
Sur-def:	-0.33	-0.38	-0.57	-0.56	-0.60
Other Exp.	0.16	0.38	0.64	0.70	0.78
Imp.	0.61	0.91	1.08	1,28	1.51
Sur-def:	-0.45	-0.53	-0.44	-0.58	-0.73

WORLD TRADE DATA - FOREST PRODUCTS

Fibreboard - Million Tons

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	0.59	1.09	1.08	1.16	1.24
Imp.	0.56	1.08	1.06	1.16	1.22
Sur-def:	+0.03	+0.01	+0.02	-	+0.02
Europe Exp.	0.49	0.90	0.84	0.91	0.97
Imp.	0.36	0.73	0.73	0.84	0.88
Sur-def:	+0.13	+0.17	+0.11	+0.17	+0.09
Other Exp.	0.10	0.19	0.24	0.25	0.27
Imp.	0.20	0.35	0.33	0.32	0.34
Sur-def:	-0.10	-0.16	-0.09	-0.07	-0.07

WORLD TRADE DATA - FOREST PRODUCTS

PARTICLE BOARD - Million Tons

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	-	-	0.67	0.79	0.90
Imp.	-	-	0.67	0.79	0.95
Sur-def:	-	-	-	-	-0.05
Europe Exp.	-	0.40	0.60	0.70	0.80
Imp.	-	0.42	0.63	0.73	0.88
Sur-def:	-	-0.02	-0.03	-0.03	-0.08
Others Exp.	-	-	0.07	0.09	0.10
Imp.	-	-	0.04	0.06	0.07
Sur-def:	-	-	+0.03	+0.03	+0.03

WORLD TRADE DATA - FOREST PRODUCTS

PLYWOOD AND BLOCKBOARDS - Million Cubic Meters

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	1.21	2.96	3.64	3.79	4.52
Imp.	1.27	2.97	3.62	3.92	4.76
Sur-def:	-0.06	-0.07	+0.02	-0.13	-0.24
Europe Exp.	0.55	0.95	1.05	1.10	1.22
Imp.	0.64	1.33	1.46	1.74	1.98
Sur-def:	-0.09	-0.38	-0.41	-0.64	-0.76
USSR Exp.	0.08	0.18	0.22	0.23	0.28
Imp.	-	-	-	-	-
Sur-def:	+0.08	+0.18	+0.22	+0.23	+0.28
Far East Exp.	0.31	1.05	1.50	1.52	2.05
Imp.	-	-	-	-	-
Sur-def:	+0.31	+1.05	+1.50	+1.52	+2.05
Other Exp.	0.21	0.31	0.35	0.32	0.35
Imp.	0.18	0.37	0.52	0.53	0.56
Sur-def:	-0.06	-0.06	-0.17	-0.21	-0.21
North America Exp.	0.15	0.41	0.52	0.62	0.62
Imp.	0.45	1.27	1.64	1.65	2.22
Sur-def:	-0.30	-0.86	-1.12	-1.03	-1.60

WORLD TRADE DATA - FOREST PRODUCTS

WOOD PULP - Million Tons

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	7.73	12.12	13.44	13.64	14.84
Imp.	7.74	11.99	13.14	13.21	14.34
Sur-def:	-0.01	+0.13	+0.30	+0.43	+0.50
North America Exp.	2.66	4.61	5.11	5.43	6.25
Imp.	2.07	2.71	3.08	2.89	3.16
Sur-def:	+0.59	+1.90	+2.03	+2.54	+3.09
Europe Exp.	4.84	6,88	7.46	7.28	7.62
Imp.	4,80	7.55	8.12	8.17	8.87
Sur-def:	+0.04	-0.67	-0.66	-0.89	-1.25
Far East Exp.	-	-	-	-	-
Imp.	0.18	0.75	0.95	1.00	1.10
Sur-def:	-0.18	-0.75	-0.95	-1.00	-1.10
Others Exp.	0.23	0.63	0.87	0.93	0.97
Imp.	0.69	0.98	0.99	1.15	1.21
Sur-def:	-.46	-0.35	-0.12	-0.22	-0.24

WORLD TRADE DATA - FOREST PRODUCTS

NEWPRINT-Million Tons

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	6.84	8.42	9.72	9.41	9.66
Imp.	6.94	8.42	9.76	9.347	9.52
Sur-def:	-0.10	-	-0.04	+0.07	+0.14
North America Exp.	5.49	6.21	7.19	6.85	6.89
Imp.	4.82	5.35	6.34	5.99	5.85
Sur-def:	+0.67	+0.86	+0.85	+0.86	+1.04
Europe Exp.	1.24	1.91	2.14	2.18	2.39
Imp.	1.02	1.71	1.90	1.79	1.99
Sur-def:	+0.22	+0.20	+0.24	+0.39	+0.40
Others Exp.	0.11	0.30	0.39	0.38	0.38
Imp.	1.10	1.36	1.52	1.56	1.68
Sur-def:	-0.99	-1.06	-1.13	-1.18	-1.30

WORLD TRADE DATA - FOREST PRODUCTS

SWAT. HARDWOOD - Million Cubic Meters

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	3.57	5.18	5.90	5.80	6.23
Imp.	3.72	5.00	5.52	5.55	5.98
Sur-def:	-0.15	+0.18	+0.38	+0.25	+0.25
North America Exp.	0.60	0.67	0.91	0.81	0.68
Imp.	0.87	1.02	1.26	1.19	1.05
Sur-def:	-0.27	-0.35	-0.35	-0.38	-0.37
Europe Exp.	1.19	1.81	2.04	2.03	2.15
Imp.	1.68	2.56	2,84	2.94	3.33
Sur-def:	-0.49	-0.75	-0.80	-0.81	-1.18
Far East Exp.	1.06	1.70	1.97	1.96	2.30
Imp.	0.14	0.33	0.42	0.48	0.50
Sur-def:	+0.92	+1.37	+1.55	+1.48	+1.80
Africa Exp.	0.42	0.67	0.74	0.65	0.70
Imp.	-	-	-	-	-
Sur-def:	+0.42	+0.67	+0.74	+0.65	+0.70
Others Exp.	0.30	0.33	0.24	0.35	0.40
Imp.	1.30	1.09	1.00	1.04	1.10
Sur-def:	-0.73	-0.76	-0.76	-0.69	-0.70

WORLD TRADE DATA - FOREST PRODUCTS

SAWN SOFTWOOD - Million Cubic Meters

AREA	AVERAGE 1955-57	AVERAGE 1963-65	1966	1967	1968
World Total Exp.	30.2	43.3	42.6	43.2	47.1
Imp.	29.0	42.4	41.4	42.5	47.1
Sur-def:	+1.2	+0.9	+1.2	+0.7	-
North America Exp.	11.2	17.2	16.5	17.7	19.1
Imp.	7.6	11.9	11.4	11.5	14.0
Sur-def:	+3.6	+5.3	+5.1	+6.2	+5.1
Europe Exp.	14.6	17.2	16.2	16.3	18.1
Imp.	16.7	25.6	24.4	24.8	26.5
Sur-def:	-2.1	-8.4	-8.2	-8.5	-8.4
USSR Exp.	2.7	7.4	8.0	7.4	7.6
Imp.	-	-	-	-	-
Sur-def:	+2.7	+7.4	+8.0	+7.4	+7.6
Far East Exp.	-	-	-	-	-
Imp.	0.3	1.1	1.3	2.0	.2
Sur-def:	-0.3	-1.1	-1.3	-2.0	-2.2
Others Exp.	1.7	1.5	1.9	1.8	2.3
Imp.	4.4	3.8	4.3	4.2	4.4
Sur-def:	-2.7	-2.3	-2.4	-2.4	-2.1

APPENDIX C

NEED Stage 3 Planning Report

HIGHWAY MAINTENANCE BUDGET REQUIREMENTS

Appendix C: HIGHWAY MAINTENANCE BUDGETARY REQUIREMENTS

A trend analysis of maintenance expenditures compared to network growth, in the 1965-1970 period, reveals that maintenance expenditures have failed to keep pace with expending network size. Moreover maintenance expenditures have never been adequate and are falling further behind minimum requirements. The Thai Highway Department spent ฿35.1 million in 1965 and ฿48.6 in 1968.[1/] If this basic trend were maintained through 1970, expenditures would then reach ฿60 million, a 1965-1970 expansion factor of 70%. The network under THD control, however, expanded from 2,325 Km. to 5,985 Km., an expansion of over 150% (the total Northeast network increased from 3,325 Km. to 8,500 Km. about the same rate of growth).

According to THD consultants, T.P.O. Sullivan, the recommended unit maintenance formulas by road type, would translate the Northeast highway budget requirement into ฿56.5 million for 1965, growing to ฿155.4 million by 1970 for the total network. Yet even these formulas are modest and assume (1) reasonable construction quality and (2) enforced traffic codes. The first assumption holds only in part, and the second not at all. This has left the highway department in a double difficulty. First, excessive axle loadings interacting with often marginal construction quality cause multiple and serious premature breakdowns in the surface. Thus a budget already inadequate by half, based on "normal"(good constructions, enforced traffic code) preventive maintenance requirement, is frequently pre-empted by pressing needs to repair and rebuild road sections which have failed completely. This situation has now resulted in the network's average condition of falling substantially below par, qualitatively, despite its relative newness. Moreover, should this situation

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1/ THD does the only extensive highway maintenance in Northeast Thailand.

prevail much longer, disinvestment by attrition can match or even exceed new investment in construction. Ongoing road sufficiency surveys will provide greater detail on the actual surface conditions.

No accurate records exist on the percentage of highway traffic which is overloaded, nor the average margin of overloading. Data based on sufficiency serveys taken to date, however, give some basis for an estimate. Generally, military traffic appears to be legally loaded. U.S. military convoys in particular appear to receive proper loading based on visual observation of open loads.

Non-military traffic, however, appears to be routinely and systematically overloaded where lading density reaches axle weight limitations prior to reaching vehicle cubic capacity. Logs, cement, construction materials, such as rock, laterite, or sand, and other products (including rice and other agricultural produce) are examples of dense lading.[1] Interception counts in the sufficiency survey suggested grossly overloaded vehicles at 5% to 10% of total traffic (single axle logging truck-cum-trailer combinations alone made up two to three percent of Route 2 traffic).

T.P. O'Sullivan, consultants to THD, have pointed out that if one percent of vehicles are substantially overloaded, this can have the same effect on a highway as does a 100 percent increase in normal traffic.

Both lateritic and paved highways, maintenance requirements have both a fixed and variable component. The variable component is related to traffic volumes. A widely recognized authority, Prof. Alan Walters of London School of Economics, in his Economics of Road User

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[1] Fuel trucks are considered to be operating within legal load limitations; however, they represent a safety hazard in view of the flammability of their cargo. Better regulation of driver working conditions as well as vehicle maintenance for all commercial operators is required.

CHART C-1

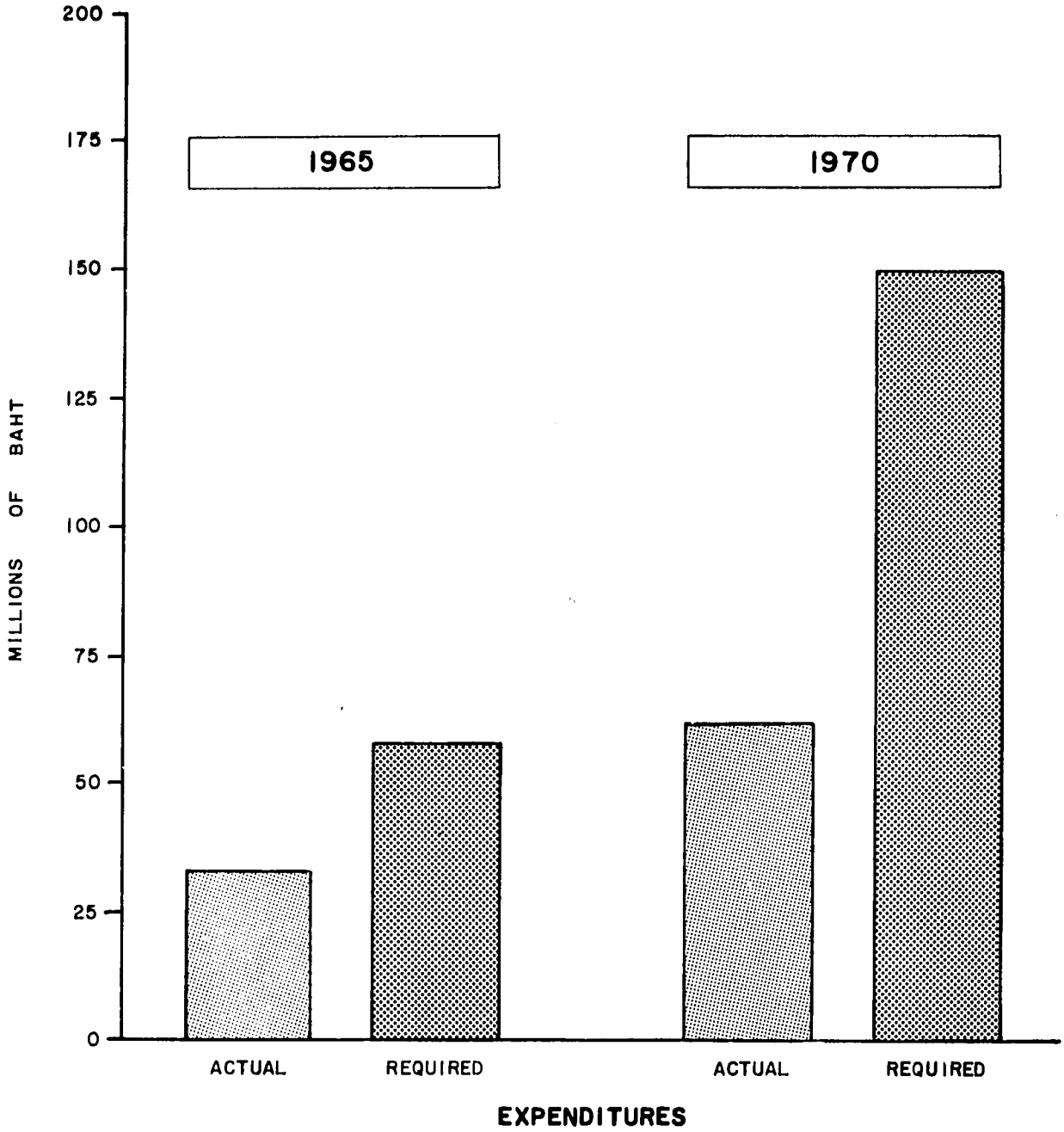
MAINTENANCE BUDGETS

REQUIRED [1] VS. ACTUAL

EXPENDITURES IN BAHT

NORTHEAST, THAILAND

1965 AND 1970



[1] ASSUMING TRAFFIC CODE ENFORCEMENT

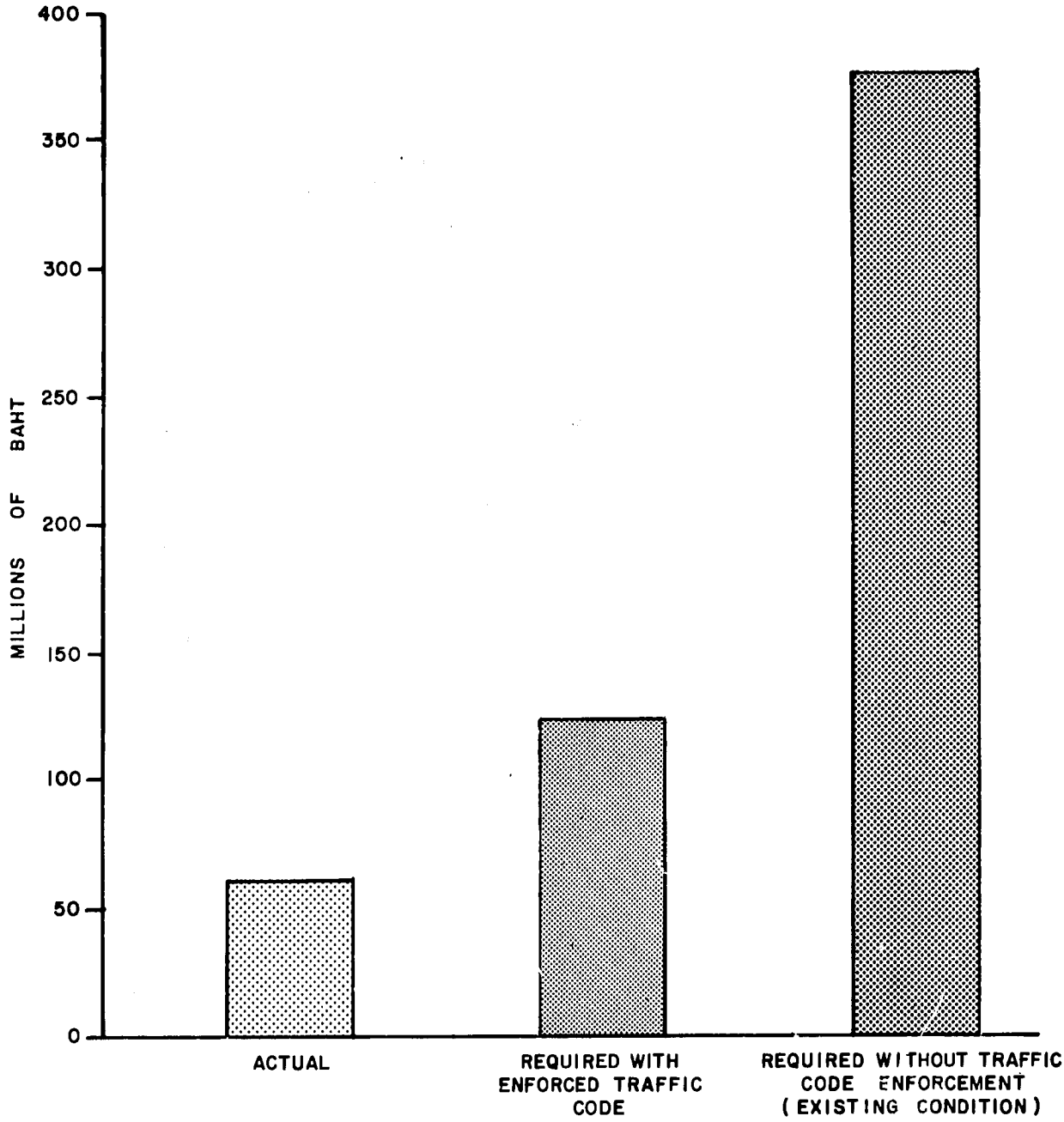
SOURCE : ESTIMATES BY NEEDPAG.

CHART C-2

ACTUAL VS REQUIRED MAINTENANCE EXPENDITURES

NORTHEAST, THAILAND

1970



SOURCE : ESTIMATES BY NEEDPAG.