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AN NSDB/USAID-ASSISTED JOINT RESEARCH UNDERTAKING OF THE BUREAU OF AGRICULTURAL ECONOMICS (DA), INSTITUTE OF AGRICULTURAL DEVELOPMENT AND ADMINISTRATION (UPLB) AND THE ECONOMIC RESEARCH SERVICE (USDA)

APRIL 1976

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AN ANALYSIS OF TRENDS IN FOOD AND COMMERCIAL CROP PRODUCTION, AREA AND YIELD IN THE PHILIPPINES, 1954-1972

J. M. RECENO, C.C. OLALO AND A. R. LIBRERO[1/]

CHAPTER I

INTROLUCTION

One of the important tasks of the government is to raise the general levels of agricultural production in order to attain self-sufficiency in rice and corn, our primary staple crops, and to increase foreign earnings from other food and commercial crops. The traditional pattern of increasing agricultural production relies chiefly on the expansion of crop area but this is limited by the availability of land suitable for cultivation. When the limit of area expansion is approached, production growth becomes more dependent upon increases in land productivity.

With land expansion appearing to reach its economic limit, further increases in crop production and productivity will have to depend mainly on the introduction of high yielding varieties,

---

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heavier application of fertilizers, better pest and disease control and improvement in cultural practices. However, in spite of the innovations being introduced in Philippine agriculture, crop production and productivity apparently remain low. This indicates the need for more concerted efforts towards obtaining greater agricultural output in order to meet the food requirements of the ever increasing population.

The relative importance of each region in producing any of the important food and commercial crops grown in the country may be determined by analyzing trends in production, area and yield. An analysis of the periodical changes in production, area and yield can also give an indication of the impact of the introduction of high yielding varieties and better management practices on production and productivity. Likewise, a knowledge on the relative influence of area and yield on production changes and on the effects of regional area shifts on national crop yield is important to policy makers as basis for planning production programs.

Objectives

The primary objective of the study is to analyze the long term trends and changes in food and commercial crop production, area and yield in the Philippines. The specific objectives are: a) to determine the relative influence of crop area and yield on national and regional changes in production; b) to determine the effects of regional area shifts on the national crop yield; and c) to determine the effects of regional cropping patterns on rice yield.

Scope and Methodology

Trends and changes in crop production, area and yield were analyzed both on the national and regional levels. Eight food and four commercial crops, namely: rice, corn, fruits and nuts, rootcrops, cacao and coffee, vegetables, beans and peas, citrus, coconut, sugarcane, tobacco and abaca were included in the analysis. The data analyzed covered a period of 19 years from 1954 to 1972. The regional analysis was limited only to nine regions of the country since time series data on crop production, area and yield from 1954 to 1972 were available only for these nine regions. The analysis on the effects of regional production patterns on rice yield, however, was done for the eleven regions of the country and covered 3 cropyears, 1970 to 1972.

The method of analysis done for all crops is descriptive in nature and was patterned after the procedure used by Mangahas et. al in their long-term trends study on rice and corn.[2/]

Annual growth rates in production, area and yield were computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

[2/] M. Mangahas, A.E. Recto and V.W. Ruttan, "Production and market relationship for rice and corn in the Philippines," Technical Bulletin, No. 9.

where:

r = annual rate of growth in production, area or yield

t = number of years

At = index of production, area or yield in 1972, and

Ao = index of production, area or yield in 1954.

Three periods were considered in determining average percentage changes in production, area and yield. The first period was from 1954/57 to 1962/65; second period, from 1962/65 to 1969/72; and the third period, from 1954/57 to 1969/72. Four-year averages in production, area and yield for the years 1954/57, 1962/65 and 1969/72 were determined after which average percentage changes for each period, e.g., 1954/57 to 1962/65 were computed by the formula:

$$APC = \left[\frac{x(1962/65)}{x(1954/57)} - 1\right] 100$$

where:

APC = average percentage change in production, area or yield

x(1962/65) = average production, area or yield in 1962/65, and

x(1954/57) = average production, area or yield in 1954/57.

On the other hand, to determine the relative influence of area and yield on production, the following formulas were used:

$$\text{Relative Influence (Area)} = \frac{\log A}{\log P} \times 100$$

$$\text{Relative Influence (Yield)} = \frac{\log Y}{\log P} \times 100$$

where:

log A = log of 4-year average of area (ending year) minus log of 4-year average of area (beginning year)

log Y = log of 4-year average of yield (ending year) minus log of 4-year average of yield (beginning year), and

log P = log of 4-year average of production (ending year) minus log 4-year average of production (beginning year).

For example for the period 1954/57 to 1962/65, 1954/57 was considered the beginning year and 1962/65, the ending year.

Computations on the impact of the regional shifts in acreage distribution in national yields were also patterned after the procedure used by Johnsons and Gustafson 1962 as cited by Mahar Mangahas and others.[3] In substance, "the procedure aims at: (a) determining, through possible combinations of area and yield whether the shifts in the distribution of acreage are likely to account for the change in the national average yield from one period to another."

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[3] Mangahas et.al. op cit., pp. 22-23.

The method can be described as follows: To measure the effect of changes in acreage distribution based on 1954/58 yields, the following weighted average of yields were calculated:

1. $$\frac{i = \sum_{1}^{9} [Ai(1954/58)Yi(1954/58)]}{i = \sum_{1}^{9} [Ai(1954/58)]}$$

2. $$\frac{i = \sum_{1}^{9} [Ai(1959/63)Yi(1954/58)]}{i = \sum_{1}^{9} [Ai(1959/63)]}$$

3. $$\frac{i = \sum_{1}^{9} [Ai(1964/68)Yi(1954/58)]}{i = \sum_{1}^{9} [Ai(1964/68)]}$$

4. $$\frac{i = \sum_{1}^{9} [Ai(1969/72)Yi(1954/58)]}{i = \sum_{1}^{9} [Ai(1969/72)]}$$

where:

Ai = rice area in the ith region

Yi = yield per hectare in the ith region

and the summation in each case is over the Philippines.

CHAPTER II

THE DATA: SOURCES AND METHODS OF COLLECTION

In 1954, the former Agricultural Economics Division of the Department of Agriculture made its first major attempt to collect sample data.[4] The first nationwide Crop and Livestock Survey, which was designed primarily to collect data on palay and other crops and on livestock and poultry, was conducted in April to June, 1954. Forty municipalities, 400 barrios and 8,000 farming households served as samples. From 1955 to 1957, the three-stage sampling procedure was employed covering 420 municipalities as the first stage; 1,270 barrios, as the second stage; and 12,300 farms,[5] as the third stage.

In 1958, the sampling design was revised, i.e., the municipality was omitted as the first stratum in sampling, as more and more information regarding barrio characteristics were accumulated. Different stratification schemes of barrios were applied and sampling with probability proportional to size was tested.[6] Around 1,200 barrios and 6,000 farming households were used as samples.

---

[4] For a brief history of agricultural data collection before 1954, see M. Mangahas, A.E. Recto and V.W. Ruttan, "Production and market relationship for rice and corn in the Philippines," Technical Bulletin No. 9, pp. 14-19.

[5] "Farm" as defined in the 1948 Census is any parcel or parcels of land actually operated by one person with an area of not less than 1,000 sq. meters for purposes of agricultural production.

[6] For a detailed discussion of these sampling techniques, see Maulit, D.A. Agricultural Surveys in the Philippines. Proceeding of the Seminar on: Sampling and Sample Surveys (March, 1962), pp. 147-151.

With the elevation of the Agricultural Economics Division to a Bureau status in 1963, the development of agricultural data collection methods continued. The sampling scheme was characterized by further changes in barrio groupings and a return to stratified simple random sampling.

Improvements introduced in the design and other phases of the survey led to what has become now known as Integrated Agricultural Survey (IAS) starting in crop year 1966-67.[7] This activity integrated four different surveys in one package and was designed as a continuing multi-purpose survey. The component surveys are: (1) Crop and Livestock Survey, (2) Crop Forecasting Survey, (3) Survey on Prices Paid and Received by Farmers, and (4) the Farm Wages Survey. Before 1967 these four surveys were conducted separately at different parts or seasons of the year.

A two-stage design was employed with the barrio as the primary sampling unit (psu) and the farm household as the secondary sampling unit (ssu).

The barrios in each province were stratified according to the prevailing cropping systems and the estimated sizes of farming areas. Barrios were grouped by cropping systems as follows:

1. barrios reportedly growing purely palay;
2. barrios reportedly growing purely corn;

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[7] Crop year corresponds with the former fiscal year i.e., from July 1 to June 30 and is indicated in the discussions that follow by the end year only e.g., cropyear 1966-67 is referred to as cropyear 1967.

3. barrios reportedly growing other crops;

4. barrios reportedly growing palay and corn;

5. barrios reportedly growing palay and other crops;

6. barrios reportedly growing corn and other crops; and

7. barrios reportedly growing palay, corn and other crops.

For each major group, barrios were then further classified into four or five different size groups, such as below 100 hectares, 100 to 199 hectares, 200 to 499 hectares, and 500 hectares and over. The number of samples determined for each province was equally allocated to the various size-classifications with a minimum of two sample barrios in each group.

The sample fraction used was variable; a sampling fraction of about 1/8 was used for every major rice-producing province and 1/22 for other provinces. The over-all sampling fraction was about 1/15 for the whole country.

The sample barrios within a stratum were drawn by simple random sampling without replacement. Within the sample barrio, one out of every 15 farm households was sampled systematically with a ramdon start. Data from sample farmers were obtained through personal interview.

The IAS has been conducted quarterly in October, January, April, and in June. The first three quarterly rounds cover a sub-sample size equivalent to 1/4 of the total number of sample barrios covered in the final June round and are aimed to collect indicators on farm prices,

wages and on crop production for purposes of forecasting. The final round was designed to provide final estimates on crop production and livestock and poultry numbers for small farms. Additional information collected include utilization of farm inputs and palay and corn stock disposition.

During the 1969 cropyear, a special survey known as the Nueva Ecija Pilot Project was launched to demonstrate and test improved techniques in field data gathering. Data collection techniques developed and tested in this pilot Project were then incorporated in the final round of IAS starting June, 1970. Since 1967 a continuous study has been undertaken in order to improve further the overall scheme of the IAS.

CHAPTER III

RICE

Rice is the major staple crop grown in the Philippines. The 1960 census of agriculture reported that palay was grown on nearly 1.5 million farms or two-thirds of all farms. Furthermore, over-half of the total cultivated hectarage in 1960 was devoted to palay production. For the 19-year period (1954/72) under review, approximately 39 percent of the total crop area was planted to rice.

National Changes in Palay Production, Area and Yield

Long-term trends in production, area and yield of rice in the Philippines can be divided into four (4) periods: (1) decreasing yield but increasing area and production from 1954 to 1956, (2) increasing area but decreasing yield and production from 1957 to 1958, (3) period of fluctuating but gradually increasing area, production and yield from 1959 to 1969 and (4) an abrupt increase in production and yield but slight decrease in area from 1969 to 1971 (Figure 3.1).

From 1954/57 to 1969/72, over-all increases of some 55 percent in production, 18 percent in area, and 31 percent in yield per hectare were attained (Table 3.1). On an annual basis the growth rates in production, area and yield per hectare from 1954 to 1972 were 2.5, 1.1, and 1.4 per cent, respectively. A continuous growth in yield if accompanied by constant acreage, would increase production in the future.

Table 3.1. Growth rates and periodical changes in palay production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72		Growth Rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72		Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72	
	percent											
Philippines	2.5	20.9	28.1	54.9	1.1	16.8	1.4	18.4	1.4	3.5	26.3	30.7
Ilocos	7.4	41.0	55.0	167.1	2.3	19.6	14.5	47.0	4.9	17.9	35.6	82.0
C. Valley	3.0	28.4	40.4	64.3	2.8	42.5	.4	39.0	0.2	-9.9	39.8	18.0
C. Luzon	1.3	3.2	36.5	40.9	0.3	-14.9	25.2	6.5	1.0	21.2	9.0	32.2
S. Tagalog	2.1	25.9	31.4	65.6	1.2	25.8	1.6	27.7	.9	.2	29.3	29.6
Bicol	3.9	49.8	34.2	101.1	-0.1	13.6	2.0	16.0	4.0	31.9	31.5	73.4
E. Visayas	1.1	-15.1	26.9	7.7	-1.0	-4.9	1.3	-3.6	2.2	-5.2	25.9	11.8
W. Visayas	1.0	.1	21.8	21.9	-0.2	-20.1	1.9	-18.6	1.2	25.4	19.5	49.8
NE Mindanao	0.5	-17.2	47.4	22.0	0.4	33.2	-6.0	25.2	0.4	-3.5	56.8	-2.5
SW Mindanao	6.7	133.5	-3.1	126.1	7.9	182.6	-20.4	24.8	-1.1	-17.4	21.8	.6

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

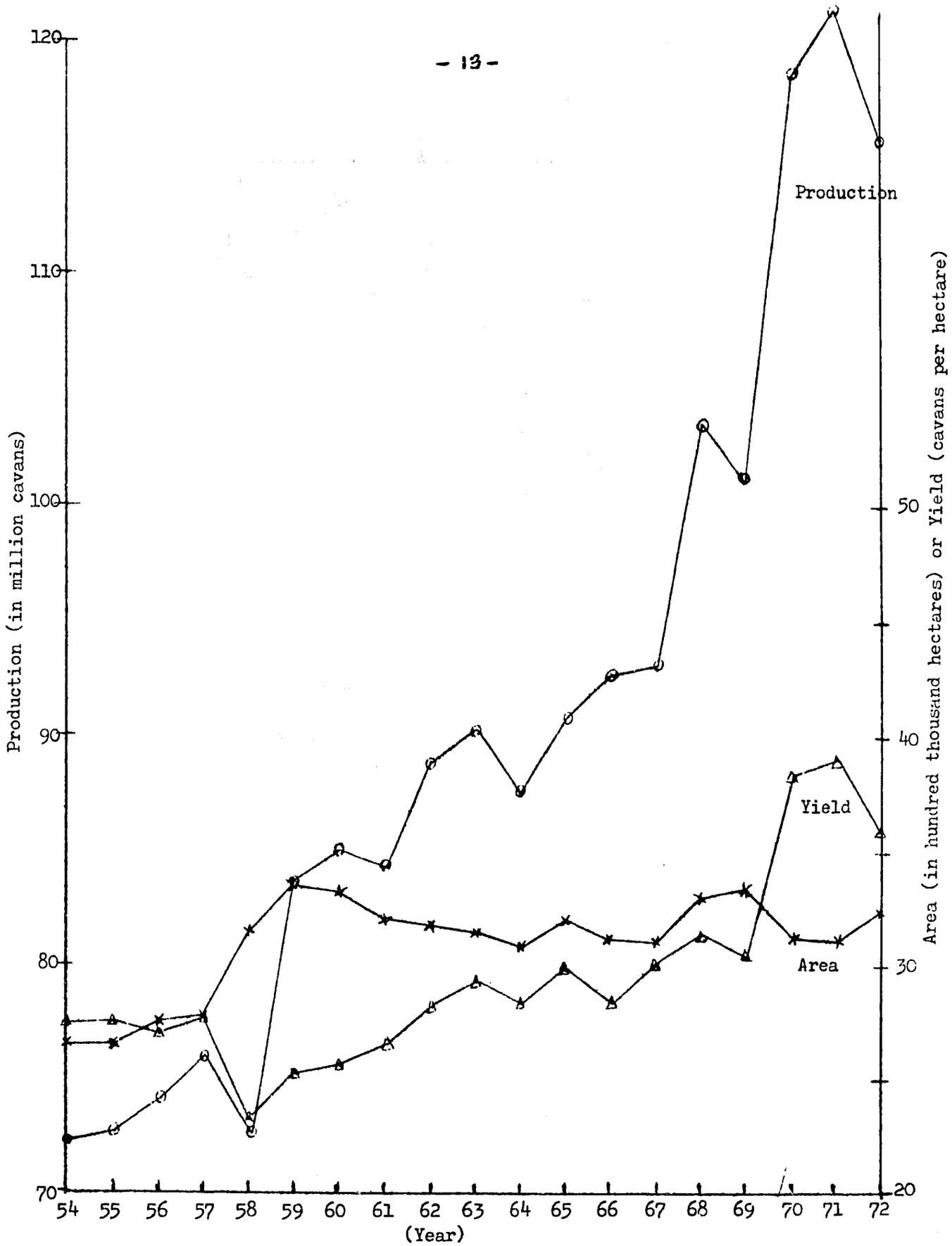

Fig. 3.1. Long-term trends in rice production, area and yield, Philippines, 1954-1972

Regional Changes in Palay Production, Area and Yield

Regional variations in production

Production increased substantially in all regions except Eastern Visayas and Northern and Eastern Mindanao for the periods 1954/57 to 1962/65 and Southern and Western Mindanao for the periods 1962/65 to 1969/72. The decrease in production in Eastern Visayas resulted from the negative changes in both area and yield; while those of Northern and Eastern Mindanao and Southern and Western Mindanao were due to the decline in yield and in area, respectively.

For the first period, 1954/57 to 1962/65, changes in production in Ilocos, Cagayan Valley, Southern Tagalog and Southern and Western Mindanao had been influenced more by area than yield (Table 3.2). On the other hand, yield influenced production more than area in the other five regions.

For the second period (1962/65 to 1969/72), however, yield had influenced changes in production more than area in all regions except Southern and Western Mindanao and Central Luzon, the major rice producing region of the country. On the average, the third period (1954/57 to 1969/72) indicated that changes in production were attributed more to changes in yield than in area for all regions except Cagayan Valley and Northern and Eastern Mindanao.

Annual variations in production

The production of palay in the various regions of the Philippines from 1954 to 1972 was generally characterized by an increasing trend,

Table 3.2. Relative influence of area and yield on palay production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
		percent			
1954/57 to 1962/65					
Philippines	20.9	81.8	18.1	.1	100
Ilocos	41.0	52.0	47.9	.1	100
C. Valley	28.4	141.8	-41.8	nil	100
C. Luzon	3.2	-518.5	618.4	.1	100
S. Tagalog	25.9	99.4	1.3	-.7	100
Bicol	49.8	31.6	68.5	-.1	100
E. Visayas	-15.1	30.8	68.9	.3	100
W. Visayas	.1	-17,762.1	17,859.2	2.9	100
NE Mindanao	-17.2	-152.2	251.9	.3	100
SW Mindanao	133.5	122.0	-22.5	.5	100
1962/65 to 1969/72					
Philippines	28.1	5.6	94.9	-.5	100
Ilocos	55.0	30.8	69.2	nil	100
C. Valley	40.4	1.4	98.6	nil	100
C. Luzon	36.5	72.4	27.6	nil	100
S. Tagalog	31.4	5.9	94.0	.1	100
Bicol	34.2	6.8	93.1	.1	100
E. Visayas	26.9	5.6	94.3	.1	100
W. Visayas	21.8	9.8	90.2	-	100
NE Mindanao	47.4	-16.0	115.9	.1	100
SW Mindanao	-3.1	713.7	-613.9	.2	100
1954/57 to 1969/72					
Philippines	54.9	38.9	61.5	-.4	100
Ilocos	167.1	39.2	60.9	-.1	100
C. Valley	64.3	66.5	33.5	nil	100
C. Luzon	40.9	18.6	81.5	-.1	100
S. Tagalog	65.6	48.7	52.2	-.9	100
Bicol	101.1	21.2	78.8	-	100
E. Visayas	7.7	-49.8	150.1	.3	100
W. Visayas	21.9	-103.3	203.1	.2	100
NE Mindanao	22.0	112.8	-12.8	nil	100
SW Mindanao	126.1	98.7	.8	.5	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year) log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

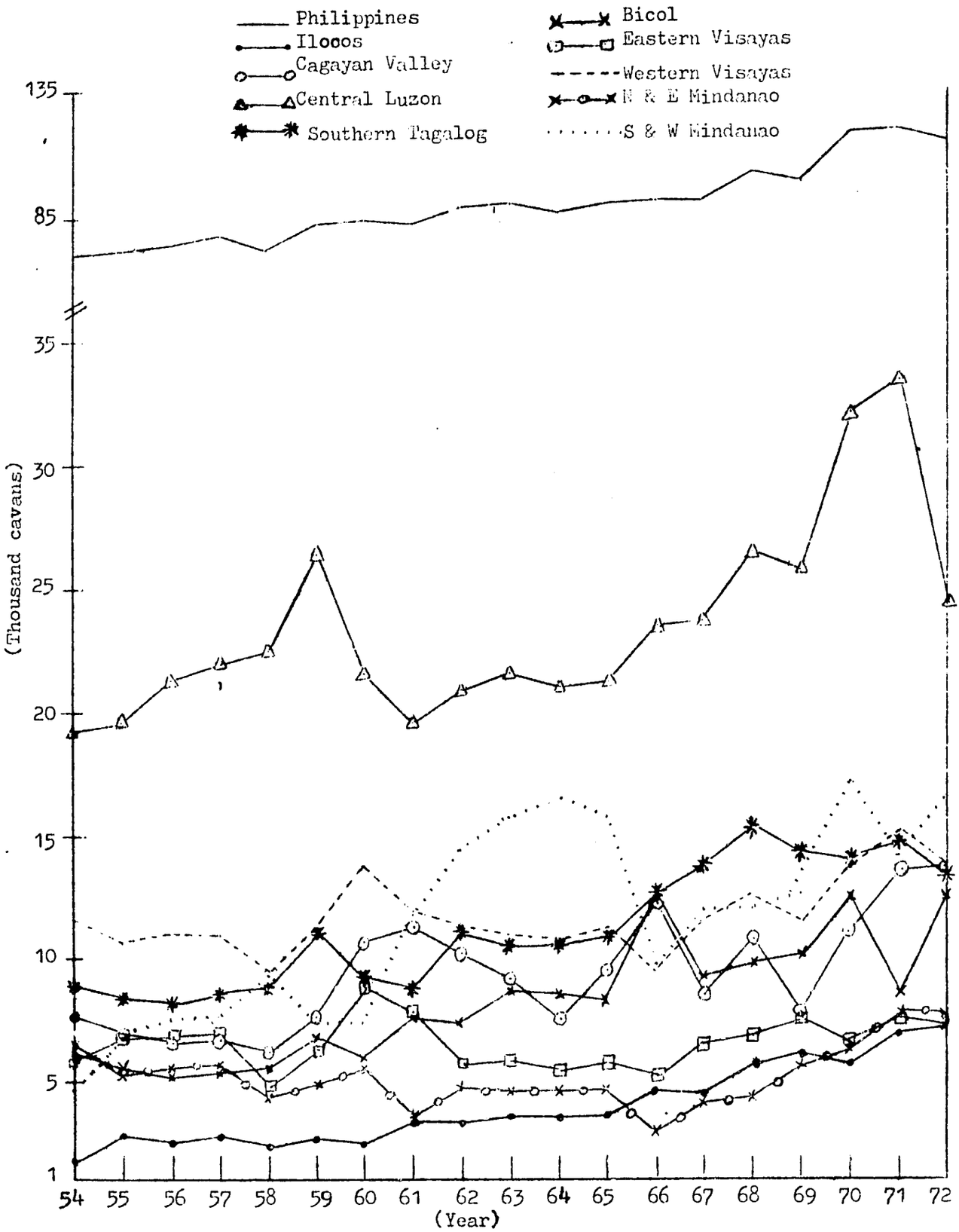

Fig. 3.2. Trends in rice production by region, Philippines, 1954-1972

with Ilocos exhibiting the highest annual rate of growth of 7.4 percent, followed by Southern and Western Mindanao with 6.7 percent. Central Luzon, the major rice producing region, registered the highest production of over 33 million cavans in 1971 but its rate of production growth was only 1.3 percent per year.

Figure 3.2 shows that palay production of Ilocos and Southern and Western Mindanao was lowest in 1954. Southern and Western Mindanao, however, managed to expand its production from 1955 that placed the region next to Central Luzon in palay production in 1962-65 and in 1970 and 1972. On the other hand, production in Ilocos was characterized by slight fluctuations but generally upward trend from 1955 to 1972.

The remaining regions also experienced moderate fluctuations and more or less increasing trend in production. It is noted, however, that Eastern Visayas and Northern and Eastern Mindanao exhibited the least production increase from 1954 to 1972.

Central Luzon had the largest contribution to total palay production during the years 1954 to 1972 (Table 3.3 and Figure 3.3). Its relative contribution for the first six years had increased from about 27 percent in 1954 to as high as 32 percent in 1959. In the next six years, however, the region exhibited a decreasing relative contribution from 25 to 23 percent. The region's palay contribution was relatively stable during the remaining years until it went down to only 21 percent in 1972.

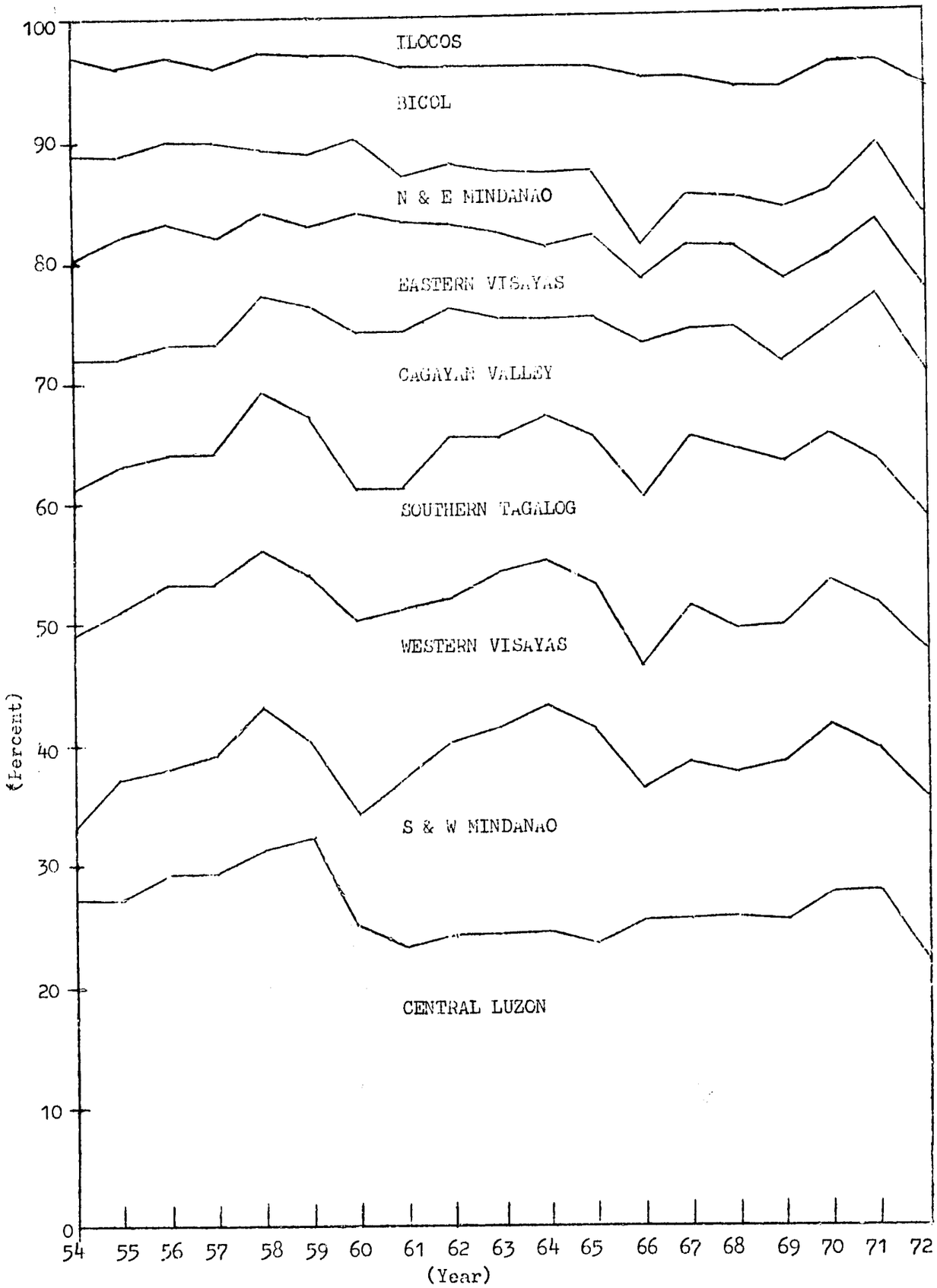

Fig. 3.3. Relative contribution of various regions to total rice production, Philippines, 1954-1972

Table 3.3. Relative contribution of various regions to total palay production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					percent					
1954	2.5	10.8	26.6	12.4	8.3	8.2	15.6	9.0	6.6	100
1955	3.6	9.7	26.9	11.4	7.5	9.4	14.8	7.1	9.6	100
1956	3.3	9.0	28.6	10.9	6.9	9.3	14.9	7.2	9.9	100
1957	3.7	8.8	28.9	11.1	6.8	9.3	14.5	7.1	9.8	100
1958	3.2	8.4	30.8	12.1	7.7	6.6	13.0	5.6	12.6	100
1959	3.1	9.0	31.6	13.2	8.0	7.3	13.3	5.7	8.8	100
1960	2.8	12.7	25.4	10.7	7.1	10.3	16.3	6.2	8.5	100
1961	3.8	13.3	23.2	10.3	8.8	9.1	14.1	3.9	13.5	100
1962	3.5	11.5	23.6	12.3	8.1	6.5	12.7	5.7	16.1	100
1963	3.8	10.1	23.9	11.4	9.6	6.5	12.2	5.1	17.4	100
1964	3.8	8.5	24.0	11.9	9.6	6.1	12.3	5.3	18.5	100
1965	4.1	10.4	23.2	11.9	9.2	6.3	12.3	5.1	17.5	100
1966	5.2	13.2	25.3	13.6	13.5	5.5	10.1	3.0	10.6	100
1967	5.0	9.1	25.4	14.7	9.7	6.9	12.5	4.0	12.7	100
1968	5.5	10.6	25.4	14.7	9.5	6.5	12.1	4.1	11.6	100
1969	5.9	7.8	25.4	13.9	10.1	7.5	11.4	5.0	12.4	100
1970	4.8	9.4	27.0	11.8	10.6	5.3	11.5	5.3	14.3	100
1971	5.8	11.1	27.4	12.0	7.1	6.2	12.4	6.4	11.0	100
1972	6.1	11.8	21.1	11.4	10.7	6.3	11.8	6.6	14.2	100

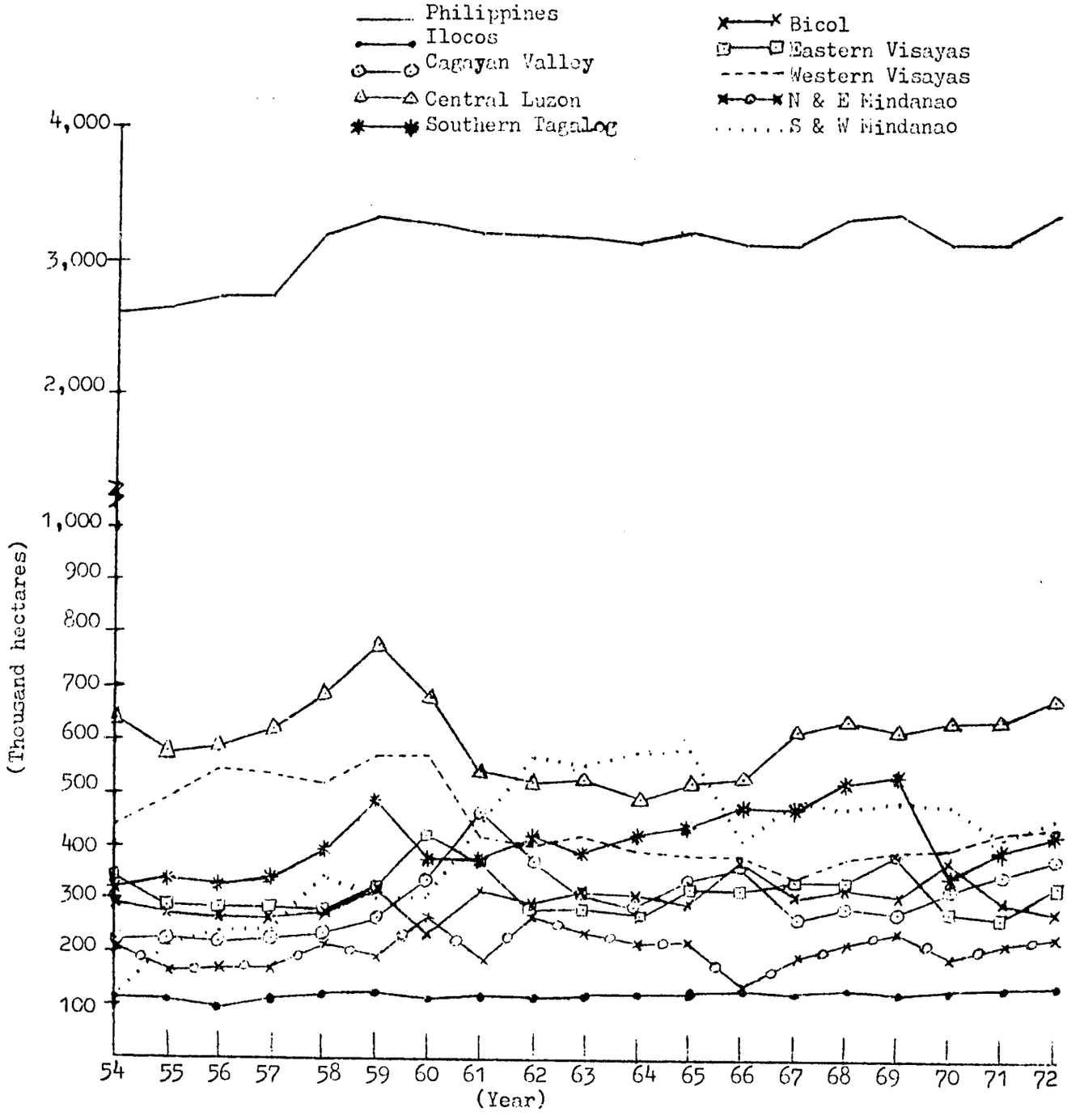

Fig. 3.4. Trends in rice area by region, Philippines, 1954-1972

From 1961 to 1965, impressive production increases in Southern and Western Mindanao resulted in a great increase in the relative contribution of this region to the total palay output. But this trend did not persist in subsequent years, thus, the region's threat of replacing Central Luzon as the most important rice producing region did not materialize. The other three regions which could also be considered important contributors to the total rice production from 1954 to 1972 are Western Visayas, Southern Tagalog and Cagayan Valley.

Area variations

The total hectarage devoted to palay was characterized by a slight increase for the first five years then fluctuated mildly during the rest of the period giving an annual rate of increase of 1.1 per cent (Table 3.1).

Southern and Western Mindanao had the highest growth rate in area harvested to palay of 7.9 per cent per year followed by Cagayan Valley with 2.8 per cent. There was a general increase in the hectarage of the former from 1954 to 1965 with a slight decline in 1969/60 followed by a moderate drop in 1966 and a stable pattern during the last six years. From 1954/57 to 1962/65 hectarage in Southern and Western Mindanao increased by 182.6 per cent but decreased by 20.4 per cent from 1962/65 to 1969/72. Except for a slight decrease in 1955, the palay hectarage in Central Luzon had a generally increasing trend up to 1959 after which it gradually dropped to its lowest in 1964. A relatively increasing trend in area was observed in the ensuing years (Figure 3.4).

Table 3.4. Relative contribution of various regions to total palay area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
						per cent				
1954	4.0	8.2	24.0	12.3	10.6	12.5	16.5	8.0	3.9	100
1955	3.8	8.9	21.6	12.5	9.9	11.2	18.3	5.9	7.9	100
1956	3.5	8.5	21.5	11.6	9.3	10.8	19.9	6.2	8.7	100
1957	3.7	8.6	21.7	12.2	9.4	10.3	19.2	6.1	8.6	100
1958	3.4	7.9	22.1	12.7	9.3	9.3	16.1	6.8	12.4	100
1959	3.5	7.9	23.1	14.4	9.1	9.7	17.1	5.9	9.3	100
1960	3.2	10.4	20.6	11.4	7.3	13.0	17.2	7.6	9.3	100
1961	3.5	14.2	17.1	11.4	9.9	11.8	12.9	5.4	13.8	100
1962	3.3	11.6	16.2	12.8	9.1	8.9	12.6	8.0	17.5	100
1963	3.8	9.9	16.5	12.6	9.8	9.1	13.2	7.7	17.4	100
1964	3.9	9.4	16.1	13.4	9.9	8.9	12.8	7.3	18.3	100
1965	4.3	10.8	16.0	13.5	9.3	9.4	12.0	6.8	17.9	100
1966	4.6	11.4	16.7	15.0	11.8	10.4	12.2	4.7	13.2	100
1967	4.3	8.6	19.4	15.1	9.7	11.2	10.8	5.8	15.1	100
1968	4.3	9.0	19.0	16.0	9.5	10.6	11.4	6.3	13.9	100
1969	4.0	8.0	18.3	16.1	9.0	11.5	11.6	7.5	14.0	100
1970	4.6	10.2	20.4	11.1	11.5	8.2	12.8	6.2	15.0	100
1971	4.9	10.8	20.6	12.5	9.6	8.1	13.5	6.8	13.2	100
1972	5.1	11.2	20.7	12.6	8.4	8.3	13.1	7.1	13.5	100

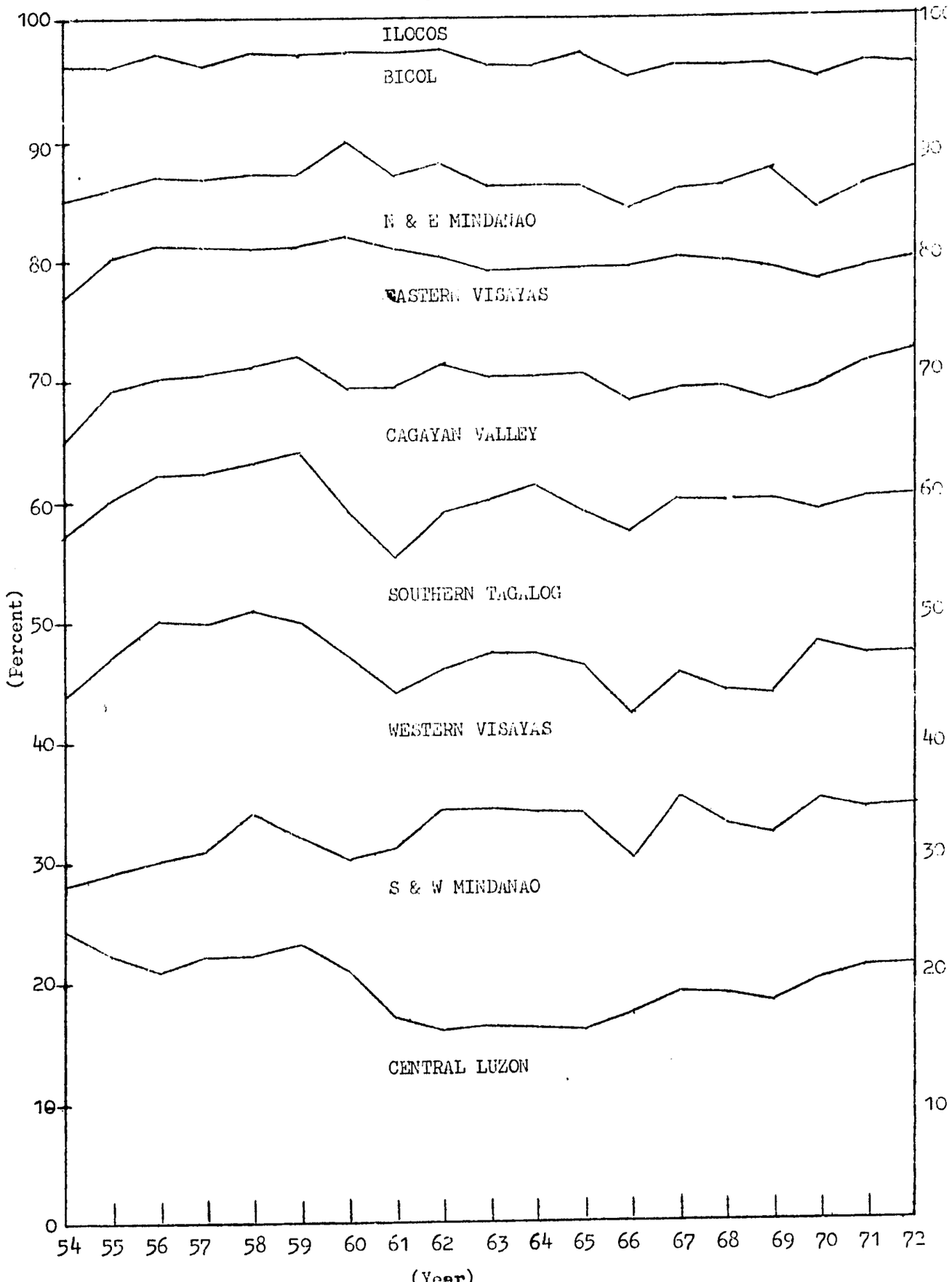

Fig. 3.5. Relative contribution of various regions to total rice area, Philippines, 1954-1972.

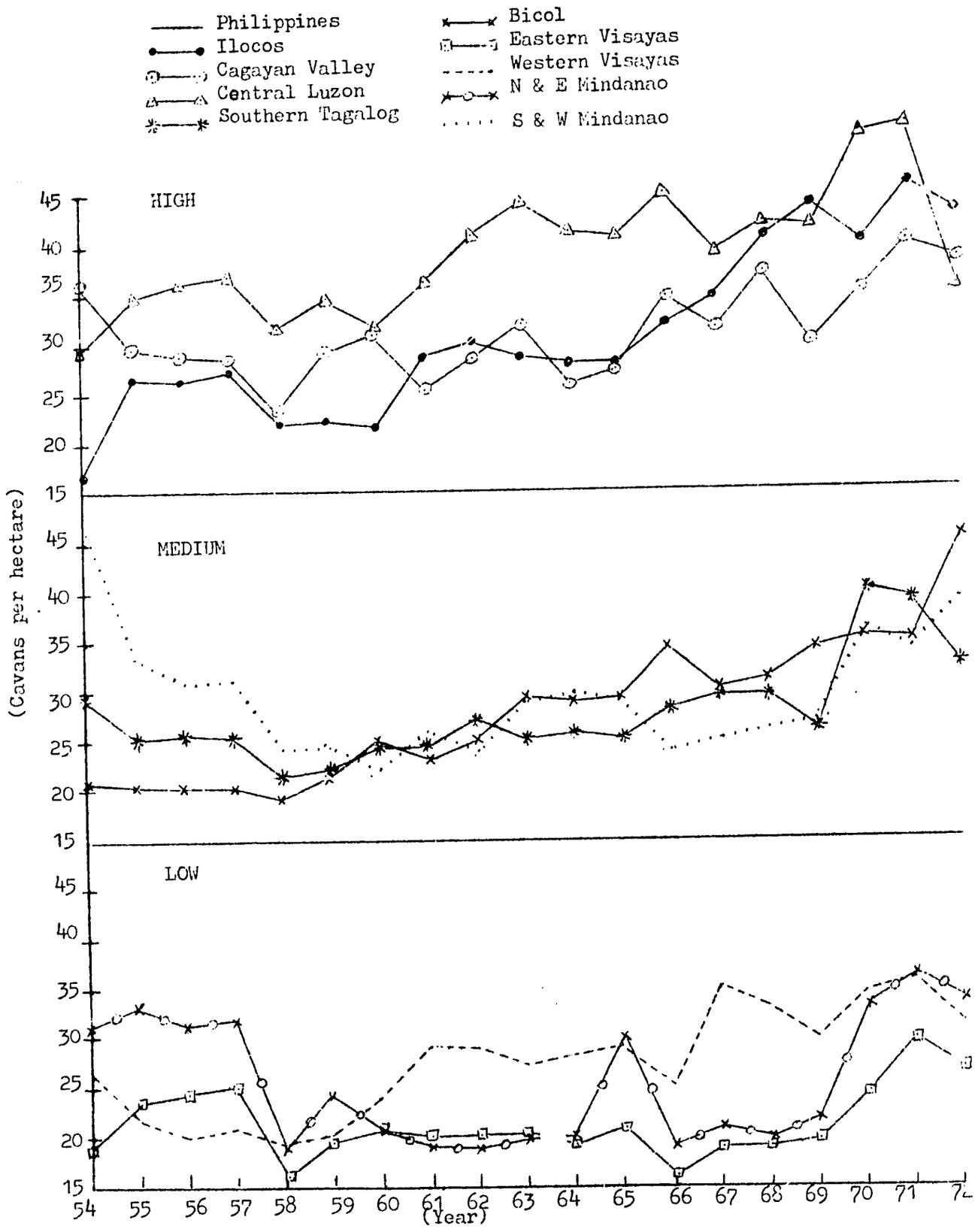

Fig. 3.6. Trends in rice yields in various regions, Philippines, 1954-1972.

The trend in palay hectarage in Eastern Visayas, Western Visayas and Bicol deviated from the general pattern, i.e., hectarage declined at an annual rate of 1.0; 0.2; and 0.1 percent, respectively.

Central Luzon had the greatest relative contribution to palay area ranging from 16 to 24 percent of the total hectarage (Table 3.4 and Figure 3.5). Other regions with high relative contribution were Southern and Western Mindanao, Western Visayas and Southern Tagalog.

The relative contributions of Southern Tagalog and Southern and Western Mindanao remained relatively stable throughout the period under review.

Yield variations

Trends in rice yield per hectare showed gradual increase from 1954 to 1972. The annual rate of growth of palay yield in the Philippines as a whole was 1.4 percent.

By region, Ilocos had the highest annual rate of growth of rice yield with 4.9 percent. In contrast, the annual growth rates of rice yield in Cagayan Valley and Northern and Eastern Mindanao were less than one percent.

The results further showed that the high rice yielding regions were Central Luzon, Cagayan Valley and Ilocos (Figure 3.6). On the other hand, the lowest rice yielding regions were Eastern Visayas, Northern and Eastern Mindanao and Western Visayas. The rest belonged to the medium yield group.

Table 3.5. Effects on regional area shifts on the national yield of rice, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
		cavans per hectare		
1954/58	26.4	26.6	26.6	26.8
1959/63	27.0	26.7	26.6	26.9
1964/68	30.3	29.7	29.6	30.0
1969/72	35.7	35.3	35.3	35.7
		yield index (1954/58 = 100)		
1954/58	100.0	100.8	100.8	101.5
1959/63	102.3	101.1	100.8	101.9
1964/68	114.8	112.5	112.1	113.6
1969/72	135.2	133.7	133.7	135.2

Effects of Regional Area Shift on National Yield

Table 3.5 shows the impact of the changes in regional acreage distribution on the national average yield of palay from 1954/58 to 1969/72. The underlined figures are the actual weighted average national yields for the four periods considered.

The analysis showed that if average yields had remained unchanged in all regions from 1954/58 to 1969/72, there would have no apparent effect of regional area shifts on the national yield. On the other hand, if the 1954/58 distribution of palay acreage among the various regions had remained constant for the period under study, the national yield per hectare would have increased from an average of 26.4 cavans in 1954/58 to 35.7 cavans in 1969/72.

The data further show that the actual yields in 1959/63 and 1964/68 were respectively higher than the 1954/58 yield by 1.1 and 12.1 percent only. However, the actual 1969/72 yield was higher than the 1954/58 yield by 35.2 percent. This implies that spectacular rice yield increases had been obtained only during the last four years.

Effects of Regional Production Patterns on Rice Yield

Table 3.6 shows the effect of different regional production patterns on regional average yields. The actual 3-year (1970/72) average yield data were obtained for the eleven regions of the country. Standardized yield data were computed by weighing each regional yield

Table 3.6. Effects of differences in regional cropping pattern on regional average yields, 1970/1972

Region	Actual Yield		Standardized Yield [a]	
	Cavan/Ha.	Index	Cavan/Ha.	Index
Philippines	37.6	100	37.6	100
Ilocos	40.8	108	41.2	110
C. Valley	40.6	108	37.6	100
C. Luzon	47.5	126	46.4	124
S. Tagalog	36.3	96	36.3	97
Bicol	36.1	96	34.9	93
E. Visayas	35.1	93	36.9	98
C. Visayas	26.5	71	26.1	71
W. Visayas	26.7	71	29.9	79
NE Mindanao	32.4	86	34.1	91
C. Mindanao	34.1	91	35.7	95
SW Mindanao	37.7	100	36.8	98

[a] Yield weighted by the distribution of Philippine palay area into first semester crop irrigated and non-irrigated and second semester crop irrigated and non-irrigated. The weights are computed by dividing the area devoted to a specific palay crop, e.g., first semester crop irrigated by the total hectarage.

by the same national hectarage distribution into first semester crop irrigated, first semester crop non-irrigated, second semester crop irrigated, and second semester crop non-irrigated.

The results showed that the actual yield in 1970/72 in Central Luzon was 47.5 cavans per hectare, or 26 percent above the national average. However, if the distribution of hectarage in the region had been the same as the national rice cropping pattern, the 1970/72 average yield in Central Luzon would have been only 46.4 cavans or 24 per cent greater than the national average. This means that about 11 per cent of the difference between the actual average yield in Central Luzon and the average national yield was due to the favorable rice cropping pattern in the region.

In Central Visayas, Western Visayas and Northern and Eastern Mindanao, the relatively high proportion of non-irrigated area accounted for the below average yields obtained in these three regions.

The results further showed that Cagayan Valley had an actual yield of 40.6 cavans per hectare. But if the production pattern for rice had been the same as that of the national level, yield in this region would be 37.6 cavans per hectare. Increased in yield would have be expected in Cagayan Valley if it had similar rice cropping pattern as that of the Philippines as a whole.

CHAPTER IV

CORN

Corn is the second major crop grown in the Philippines. The number of corn farms is approximately two-thirds of the total number of rice farms. Likewise, corn hectarage is about two-thirds of the area devoted to rice production. About one-fifth of the population is reported to be eating corn as a staple crop. As such corn is next to rice in the country.

National Changes in Corn Production, Area and Yield

Trends in corn production, area and yield in the Philippines from 1954 to 1972 showed periods of: (1) fluctuating but generally increasing area and production but gradually decreasing yield from 1954 to 1959 and (2) moderately increasing trend in production, area and yield from 1960 to 1972 (Figure 4.1).

Over the 19-year period, the annual rates of growth in production, area and yield were 5.1, 4.2 and 0.9 per cent, respectively. Average national changes in corn production and area in 1962/65 to 1969/72 were lower than in 1954/57 to 1962/65 but the reverse was noted for yield changes (Table 4.1). From 1954/57 to 1969/72, corn production in the country increased by 131.3 per cent. This was brought about by positive changes in both area (59.1%) and yield (44.2%).

Table 4.1. Growth rates and periodical changes in corn production, area and yield by region, Philippines, 1954-1972

REGION	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72		Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72		Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72	
	per cent											
Philippines	5.1	53.4	50.8	131.3	4.2	30.4	22.0	59.1	0.9	17.6	23.6	45.4
Ilocos	3.9	-37.0	59.6	57.1	3.9	-3.6	11.6	45.0	nil	-34.8	43.1	8.0
C. Valley	5.6	20.1	77.4	106.7	5.4	18.3	72.7	99.8	0.4	1.5	2.8	3.5
C. Luzon	11.7	-23.4	59.1	21.9	3.3	-17.3	33.1	10.1	0.9	-7.0	19.6	10.7
S. Tagalog	5.6	53.1	81.6	178.1	4.7	10.3	57.9	74.2	0.7	38.9	14.9	59.6
Bicol	3.9	27.0	66.0	110.9	4.3	17.8	44.8	70.6	-0.3	7.7	14.6	23.6
E. Visayas	-0.2	-8.0	6.0	-2.0	1.3	-7.8	-17.5	-23.9	-0.2	0.2	28.5	28.8
W. Visayas	0.4	10.6	24.0	37.2	1.1	-1.6	9.9	8.1	0.9	12.4	12.8	26.9
NE Mindanao	2.7	65.7	6.9	77.2	3.2	38.9	11.4	54.8	0.4	19.3	-4.0	14.5
SW Mindanao	10.9	170.0	73.1	367.5	9.4	143.4	35.4	229.5	1.4	10.9	27.9	41.9

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = numbers of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

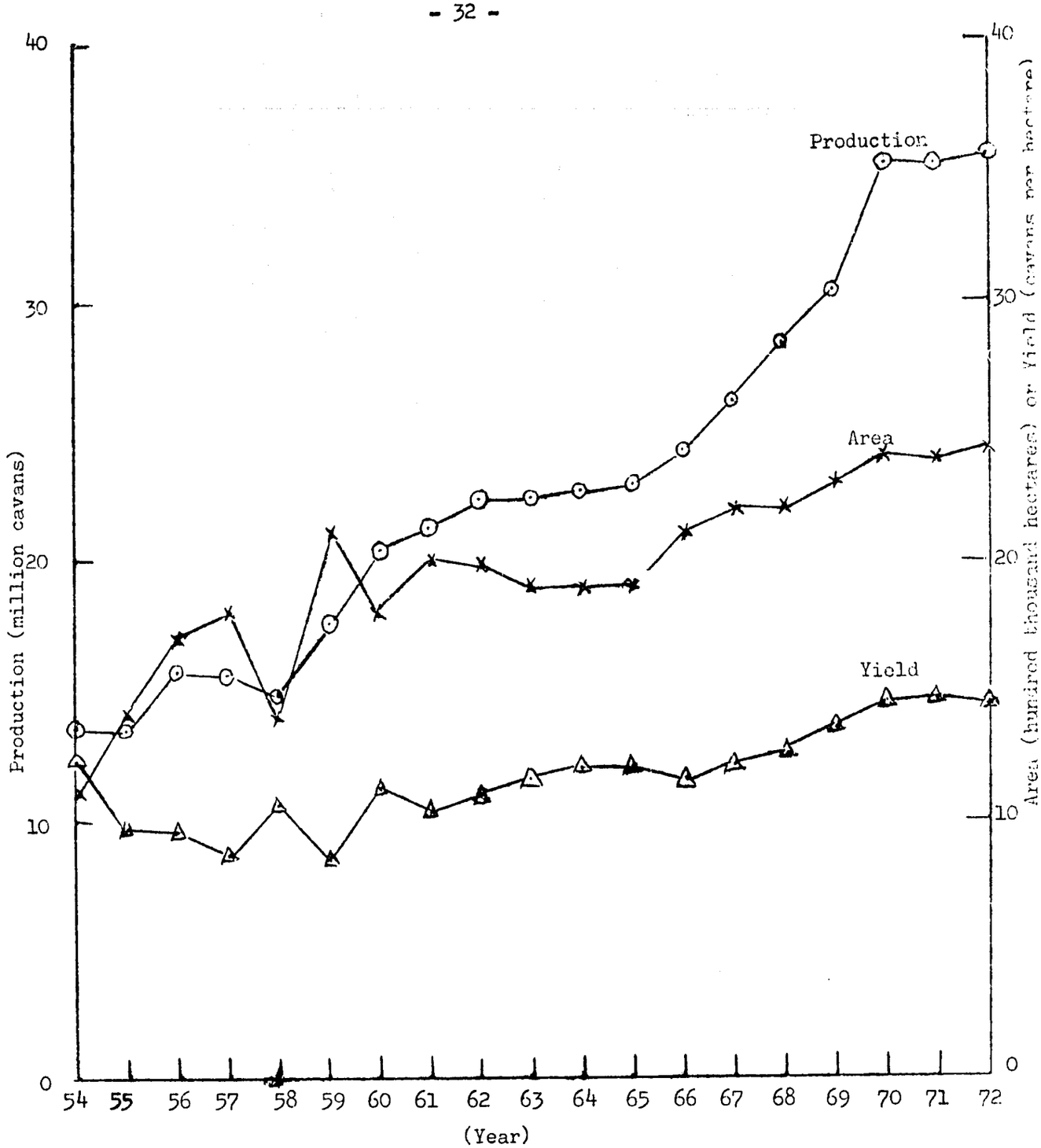

Fig. 4.1. Long-term trends in corn production, area and yield, Philippines 1954-1972

Table 4.2. Relative influence of area and yield on corn production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	II Term c/	Total
		per cent			
1954/57 to 1962/65					
Philippines	53.4	62.1	37.9	nil	100
Ilocos	-37.0	7.8	92.2	nil	100
C. Valley	20.1	91.8	8.2	nil	100
C. Luzon	-23.4	71.3	28.7	nil	100
S. Tagalog	53.1	23.0	77.0	nil	100
Bicol	27.0	68.7	31.3	nil	100
E. Visayas	- 8.0	102.5	-2.5	nil	100
W. Visayas	10.6	-16.3	116.3	nil	100
NE Mindanao	65.7	65.0	35.0	nil	100
SW Mindanao	170.0	89.6	10.4	nil	100
1962/65 to 1969/72					
Philippines	50.8	48.4	51.6	nil	100
Ilocos	59.6	23.4	76.6	nil	100
C. Valley	77.4	95.2	4.8	nil	100
C. Luzon	59.1	61.6	38.4	nil	100
S. Tagalog	81.6	76.6	23.4	nil	100
Bicol	66.0	73.0	27.0	nil	100
E. Visayas	6.0	-330.0	430.1	-.1	100
W. Visayas	24.0	44.0	56.0	nil	100
NE Mindanao	6.9	161.2	-61.2	nil	100
SW Mindanao	73.1	55.2	44.8	nil	100
1954/57 to 1969/72					
Philippines	131.3	55.4	44.6	nil	100
Ilocos	57.1	82.4	17.6	nil	100
C. Valley	106.7	95.3	4.7	nil	100
C. Luzon	21.9	48.5	51.5	nil	100
S. Tagalog	178.1	54.3	45.7	nil	100
Bicol	110.9	71.6	28.4	nil	100
E. Visayas	- 2.0	1325.7	-1226.1	.4	100
W. Visayas	37.2	24.7	75.3	nil	100
NE Mindanao	77.2	76.3	23.7	nil	100
SW Mindanao	367.5	77.3	22.7	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

Regional Changes in Corn Production, Area and Yield

Regional variations in production

All regions except Eastern Visayas exhibited positive changes in production for the period 1954/57 to 1969/72. For the period 1954/57 to 1962/65, Ilocos and Central Luzon experienced negative changes in production due to decreases in area and yield.

From 1954/57 to 1962/65, changes in production were influenced more by area than yield in all regions except Ilocos, Southern Tagalog and Western Visayas (Table 4.2). For the second period (1962/65 to 1969/72), changes in production for the country as a whole was due more to yield than area, the reverse was noted in most regions.

During the first two years (1954/55), Eastern Visayas had the greatest corn production but subsequently displaced by Southern and Western Mindanao with peak production in 1970 of 17.4 million cavans (Figure 4.2). In 1956, sharp declines in production were observed in the two Visayas regions, Southern Tagalog and Central Luzon. However, production in these regions recovered in the succeding years.

Southern and Western Mindanao stood out as the largest contributor to total corn production. For the first two years (1954/55) Eastern Visayas led all regions with its relative contribution of 23-25 per cent to total corn production (Table 4.3). Southern and Western Mindanao was second with 17-19 per cent; Western Visayas, third with 15-19 per cent; and Northern and Eastern Mindanao, fourth with 13-14 per cent. During the years 1967 and 1969 the relative

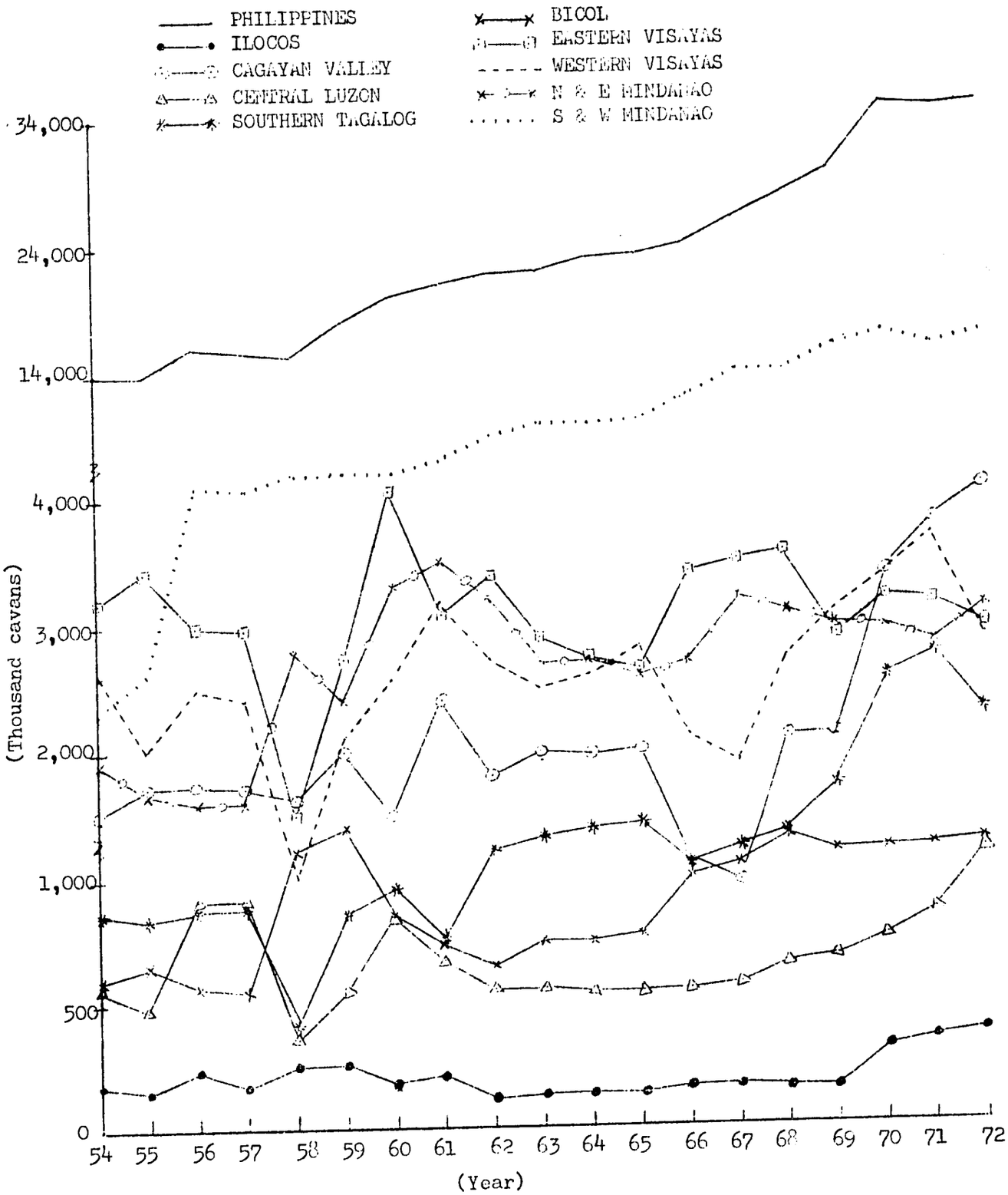

Fig. 4.2. Trends in corn production by region, Philippines, 1954-1972

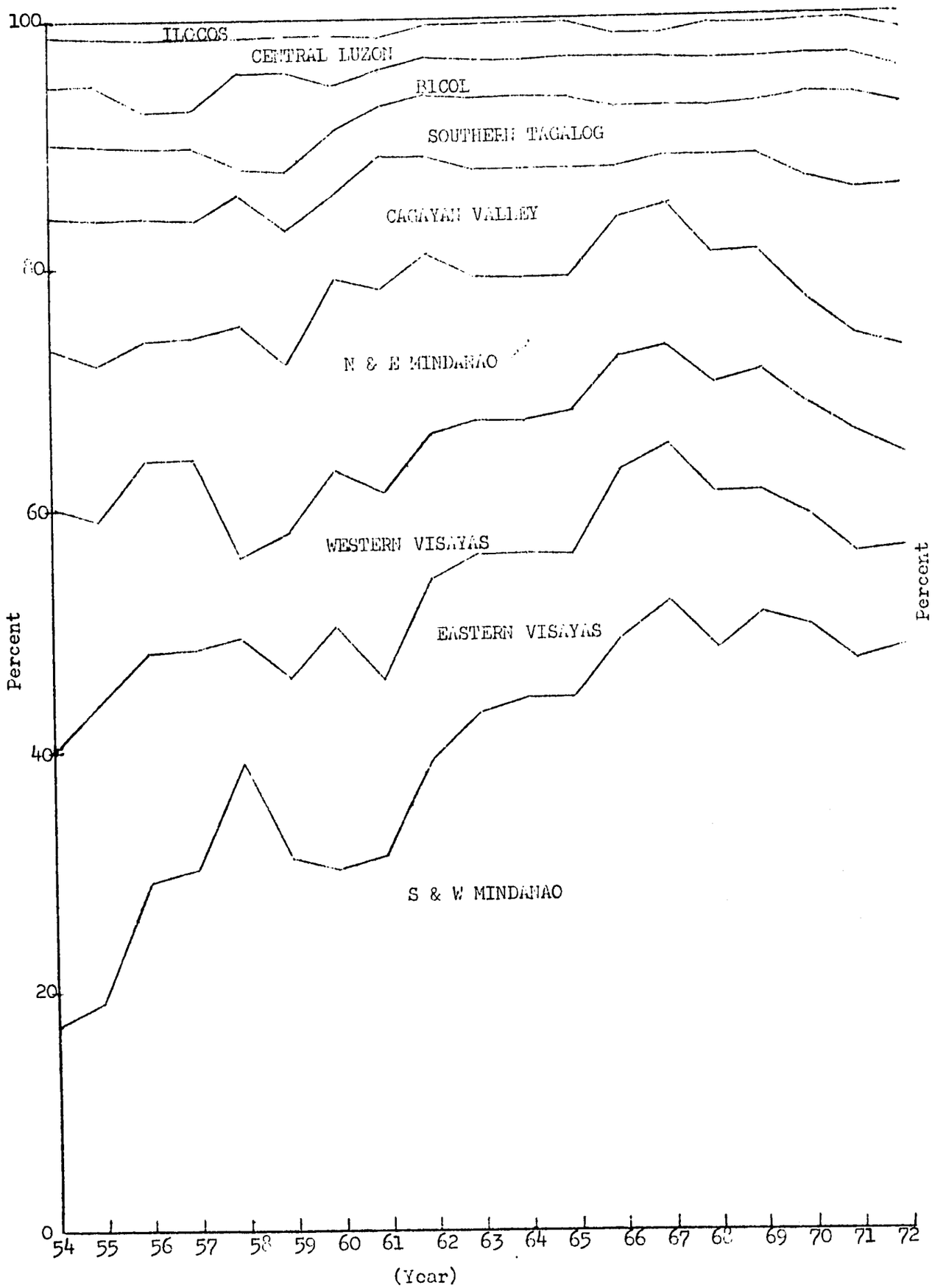

Fig. 4.3. Relative contribution of various regions to total corn production. Philippines, 1954-1972

Table 4.3. Relative contribution of various regions to total corn production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	1.3	11.0	4.0	6.1	4.3	23.2	19.4	13.7	17.0	100
1955	1.2	12.4	3.6	6.1	4.8	25.2	14.8	12.7	19.2	100
1956	1.3	10.8	5.6	5.4	3.3	19.1	15.5	10.0	29.0	100
1957	1.2	10.6	5.7	5.6	3.4	18.8	15.3	9.9	29.5	100
1958	1.5	10.9	2.4	2.6	7.9	10.0	6.9	18.7	39.1	100
1959	1.3	11.1	3.1	4.8	8.1	15.0	12.1	13.6	30.9	100
1960	0.9	7.5	4.2	4.6	4.1	20.0	12.9	16.1	29.7	100
1961	0.9	11.4	3.1	3.6	3.4	14.7	15.1	16.7	31.1	100
1962	0.5	8.0	2.5	5.5	2.9	15.2	12.2	14.6	38.6	100
1963	0.5	9.4	2.5	5.6	3.3	13.0	11.1	12.0	42.6	100
1964	0.5	8.7	2.3	6.0	3.2	12.0	11.4	11.9	44.0	100
1965	0.5	8.9	2.3	6.0	3.4	11.4	12.0	11.2	44.3	100
1966	0.6	4.7	2.2	4.7	4.3	13.9	8.8	11.4	49.4	100
1967	0.6	5.8	2.2	4.6	4.1	13.4	7.2	12.2	51.9	100
1968	0.5	7.2	2.2	4.4	4.4	12.6	9.7	11.0	48.0	100
1969	0.5	6.9	2.3	5.5	3.8	9.6	10.3	9.9	51.2	100
1970	0.8	9.7	2.1	7.4	3.4	9.1	9.5	8.5	49.5	100
1971	0.9	10.8	2.4	8.1	3.5	8.9	10.5	8.0	46.9	100
1972	1.1	12.1	3.4	6.6	3.5	8.6	8.2	8.9	47.6	100

contributions of Southern and Western Mindanao were more than one-half of the total corn output. This terrific increase in the corn production of this region was neither matched by Northern and Eastern Mindanao nor the two Visayas regions which declined in importance as corn producers. The relative contributions of these regions gradually dropped as years passed.

Of the Luzon regions, Cagayan Valley contributed the most to corn production followed by Southern Tagalog, Bicol and Central Luzon. The smallest corn producer of all regions was Ilocos.

Area Variations

The general pattern of the total area planted to corn showed an irregularly increasing trend save for a distinct drop in 1958. Moreover, it reveiled a rate of growth per year of 4.2 per cent.

Figure 4.4 shows the tremendous increase (approximately 251,000 hectares per year) in area devoted to corn in Southern and Western Mindanao. Central Luzon and Southern Tagalog exhibited more or less the same fluctuations in corn area from 1954 to 1961 but the latter had more stable upward trend in subsequent years. Most regions showed great fluctuation in corn area from 1954 to 1961. All regions experienced increasing trend except Eastern Visayas which showed a downward trend.

Southern and Western Mindanao, Eastern Visayas, Western Visayas and Northern and Eastern Mindanao in that order of importance had the greatest relative contribution to total area planted

Table 4.4. Relative contribution of various regions to total corn area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	1.5	8.2	4.4	5.9	4.7	27.1	20.2	13.0	15.0	100
1955	1.4	7.9	4.3	6.0	4.8	32.4	14.8	13.4	15.0	100
1956	1.2	6.5	5.9	5.4	3.9	26.4	18.1	10.4	22.2	100
1957	1.0	6.2	5.4	6.4	3.4	27.1	20.0	9.8	20.7	100
1958	1.3	9.3	3.0	4.6	8.8	17.6	11.7	17.3	26.4	100
1959	1.2	8.2	2.8	4.0	8.1	24.0	14.7	10.7	26.3	100
1960	1.2	7.0	3.9	4.4	4.0	24.2	16.4	14.6	24.3	100
1961	1.2	7.4	3.8	5.3	4.2	16.9	16.5	16.0	28.7	100
1962	1.0	6.6	3.5	5.2	3.8	20.9	13.6	14.1	31.3	100
1963	1.0	6.5	3.3	4.9	3.7	20.2	13.2	12.1	35.1	100
1964	1.0	6.2	3.0	5.0	3.6	19.3	14.3	11.4	36.2	100
1965	0.9	6.3	3.0	4.9	3.7	19.1	14.3	10.9	36.9	100
1966	1.0	4.9	2.6	5.6	4.1	19.9	11.8	10.6	39.5	100
1967	1.0	4.2	2.7	5.5	4.2	19.5	9.1	12.3	41.5	100
1968	1.0	5.8	2.6	5.2	4.3	17.8	12.1	11.2	40.0	100
1969	1.0	7.0	3.4	5.6	4.3	13.7	13.0	11.7	40.3	100
1970	1.1	8.2	3.3	6.6	4.2	13.7	12.5	10.8	39.6	100
1971	1.3	9.6	3.4	6.9	4.2	13.6	12.6	10.9	37.5	100
1972	1.5	10.4	3.8	6.7	4.9	12.8	11.7	10.9	37.3	100

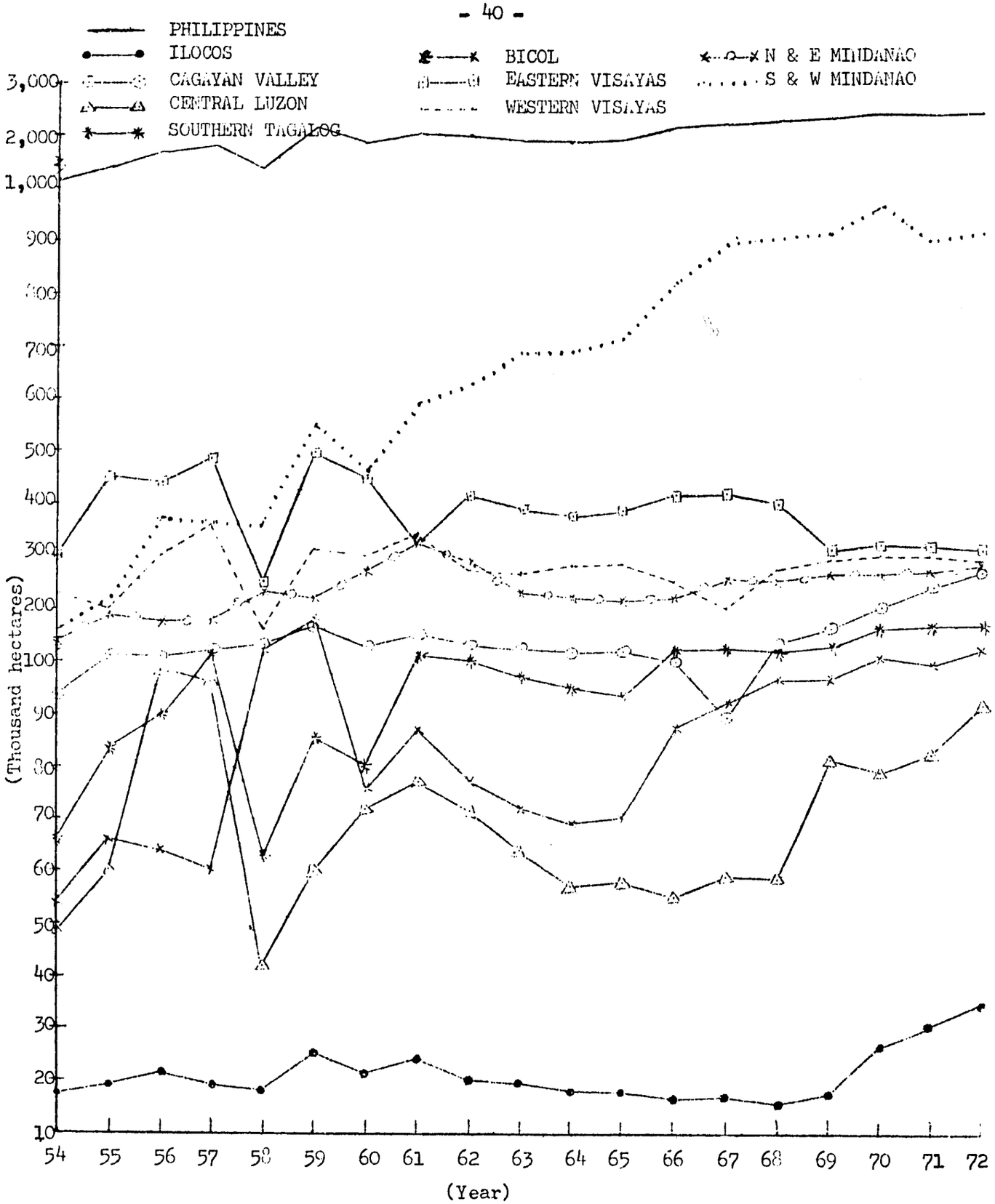

Fig. 4.4. Trends in corn area by region, Philippines, 1954-1972

Table 4.5. Effects of regional area shifts on the national yield of corn, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	cavans per hectare			
1954/58	10.0	10.5	10.9	11.2
1959/63	10.1	10.4	10.7	10.9
1964/68	11.1	11.7	12.1	12.3
1969/72	12.7	13.4	14.1	14.3
	yield index (1954/58 = 100)			
1954/58	100.0	105.0	109.0	112.0
1959/63	101.0	104.0	107.0	109.0
1964/68	111.0	117.0	121.0	123.0
1969/72	127.0	134.0	141.0	143.0

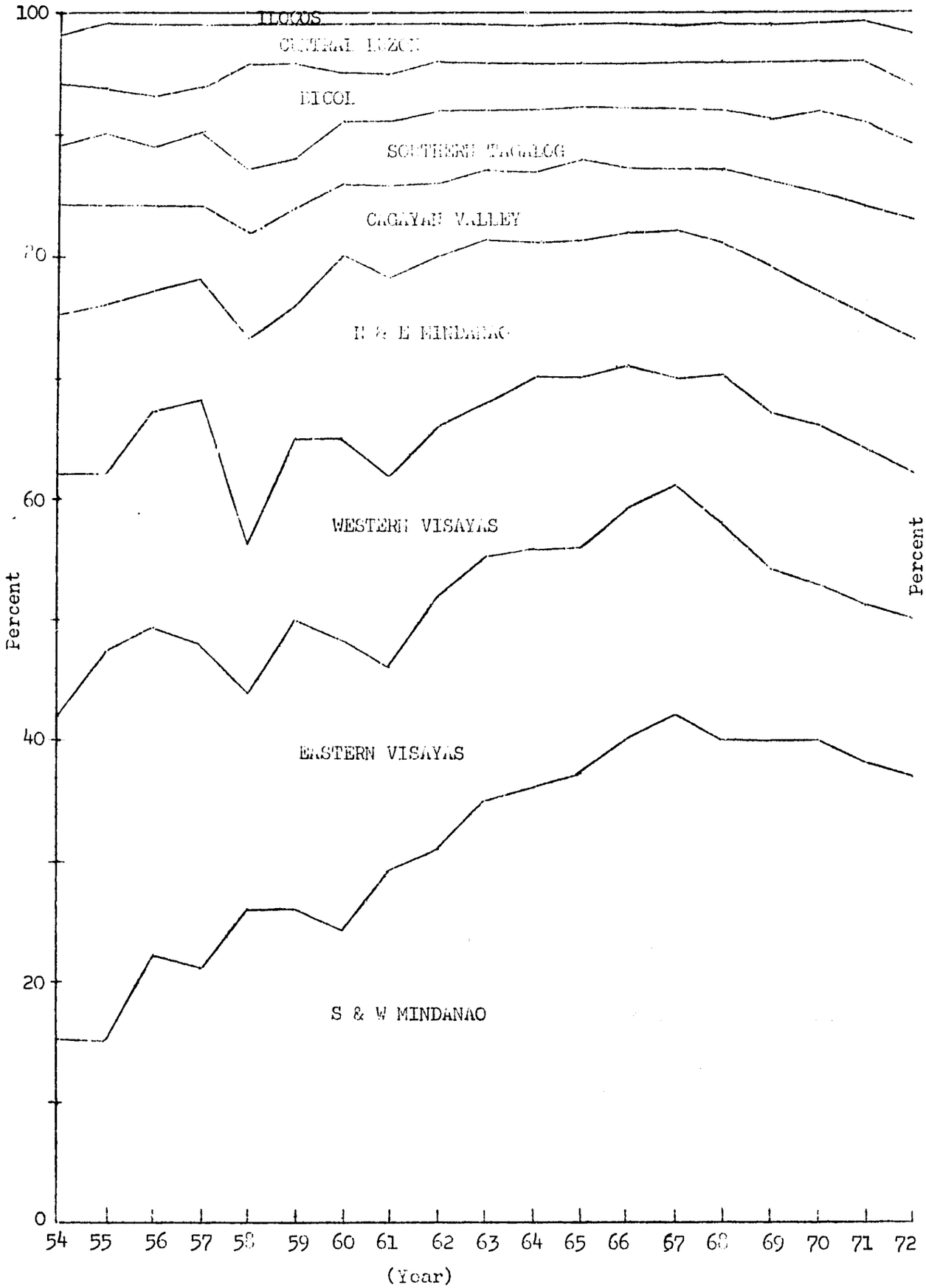

Fig. 4.5. Relative contribution of various regions to total corn area, Philippines, 1954-1972

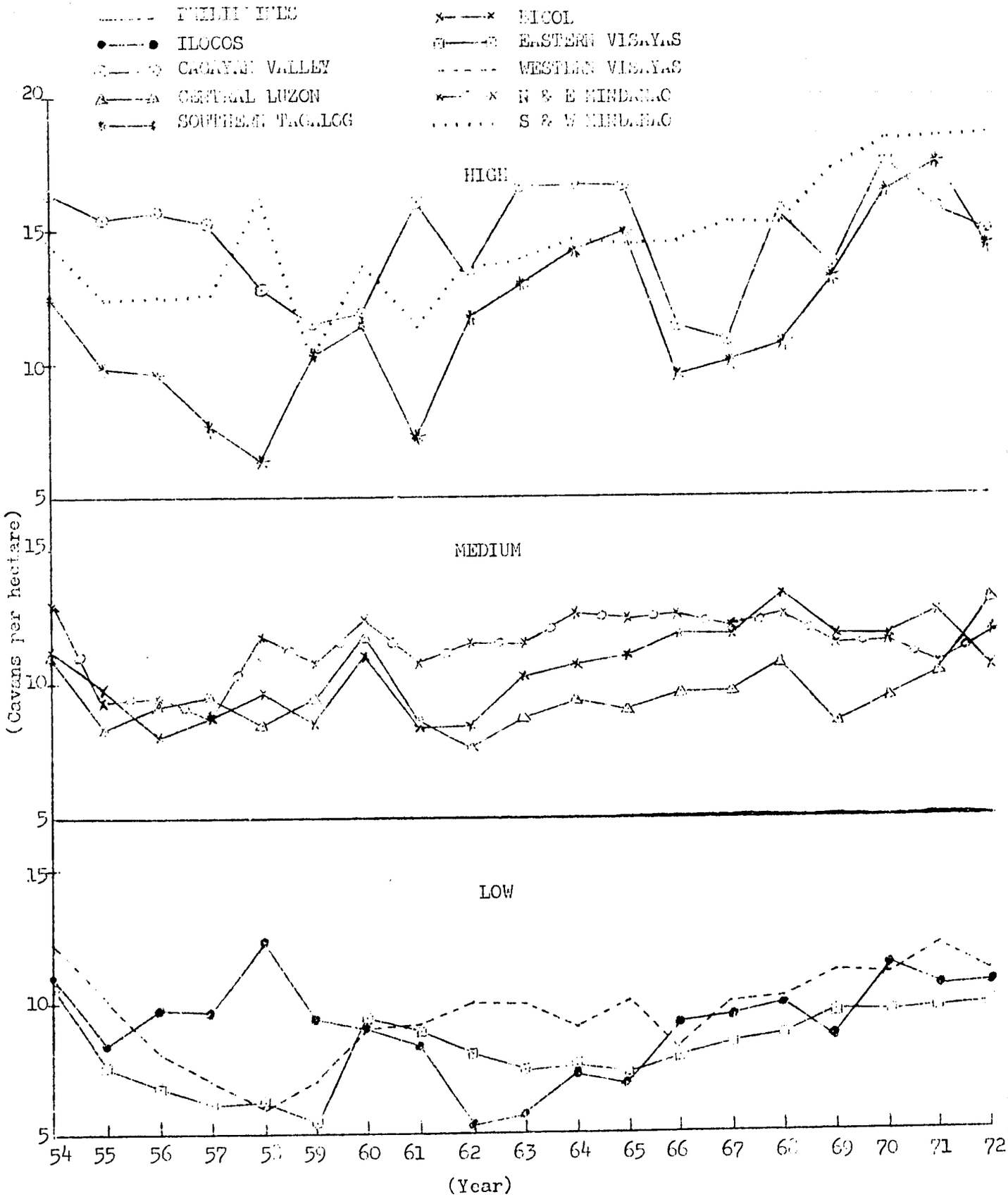

Fig. 4.6. Trends in corn yields in various regions, Philippines, 1954-1972

to corn (Figure 4.5 and Table 4.4). In Luzon, Cagayan Valley had the highest contribution to corn area and Ilocos, the least.

Yield Variations

Trends in corn yield exhibited fluctuating but increasing pattern (Figure 4.6). There was greater fluctuation in corn yield in the high yielding regions, namely: Southern and Western Mindanao, Cagayan Valley and Southern Tagalog. Regions with relatively low but stable yields were Eastern Visayas, Western Visayas and Ilocos. The rest of the regions belonged to the medium yield category.

Effects of Regional Area Shifts on National Corn Yield

Table 4.5 shows that if the 1954/58 regional yields had remained constant, the national average yield in 1969/72 would have been 11.2 cavans per hectare or 12 per cent higher than the actual yield. This result indicates the positive effect of regional area shifts on the national average yield of corn. This could be explained by higher concentration of corn production in the high yielding regions during the latter years.

On the other hand if the regional area distribution in 1969/72 had been the same as in 1954/58, the national average yield of corn per hectare would have been 12.7 cavans instead of 14.3 cavans.

The positive effect on national yield of the changes in acreage distribution among the various regions found in the analysis confirmed the earlier result of Mangahas et. al,[8/]. However, the magnitude of the effect in this study was greater.

[8/] Ibid., pp. 34-35.

CHAPTER V

FRUITS AND NUTS

Some of our major present and potential export crops like banana, mango and pineapple are included under this crop category. About 4 per cent of the total crop area is planted to fruits and nuts. Moreover, more than one-tenth of the total value of all crops harvested is derived from fruits and nuts. These crop contribute in no small amount to the dollar-earnings of the country.

National Changes in Fruits and Nuts Production, Area and Yield

Over the whole period, production and yield had the same slightly upward trend from 1954 to 1961 followed by a fluctuating but rapidly increasing trend from 1962 to 1972. On the other hand, area devoted to fruits and nuts exhibited a very slight upward trend with minor dips in 1959/60, 1966/67 and 1971 (Figure 5.1).

Fruits and nuts' production, area and yield in the Philippines had annual rates of growth of 6.1, 1.0 and 5.1 per cent, respectively. For the period 1954/57 to 1969/72, national production increased by 162.3 per cent resulting from increases in yield by 132.4 per cent and in area by 12.6 per cent (Table 5.1).

Regional Changes in Fruits and Nuts Production, Area and Yield

In terms of production, bananas were the major fruit crop produced in all regions except in Central Luzon where watermelon was the main fruit

Table 5.1. Growth rates and periodical changes in fruits and nuts production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72
	per cent											
Philippines	6.1	81.5	44.5	162.3	1.0	10.8	1.7	12.6	5.1	63.7	41.9	132.4
Ilocos	1.9	21.7	26.7	54.1	-1.1	-7.4	-12.7	-19.2	.8	31.3	45.5	91.0
C. Valley	8.6	162.4	47.2	286.2	.9	-12.3	16.2	1.9	7.7	199.4	26.6	279.0
C. Luzon	7.3	46.4	83.6	168.9	1.2	17.0	5.0	22.9	6.0	25.7	74.2	118.9
S. Tagalog	4.2	96.2	6.4	108.9	.6	5.6	3.9	9.6	3.6	86.6	2.3	90.8
Bicol	1.2	49.1	-18.5	21.5	.4	20.4	-3.0	16.8	.9	24.1	-16.1	4.1
E. Visayas	6.0	219.9	-17.3	164.6	.9	50.1	-29.0	6.6	5.1	112.9	16.6	148.2
W. Visayas	7.1	82.5	104.2	272.5	.6	18.0	-6.7	10.0	6.5	54.4	119.3	238.6
NE Mindanao	6.4	72.5	54.0	165.6	1.2	-11.5	22.2	8.2	5.1	95.0	25.8	145.4
SW Mindanao	7.9	-16.2	250.6	194.0	3.2	-17.4	69.4	39.9	4.6	1.5	106.8	109.9

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

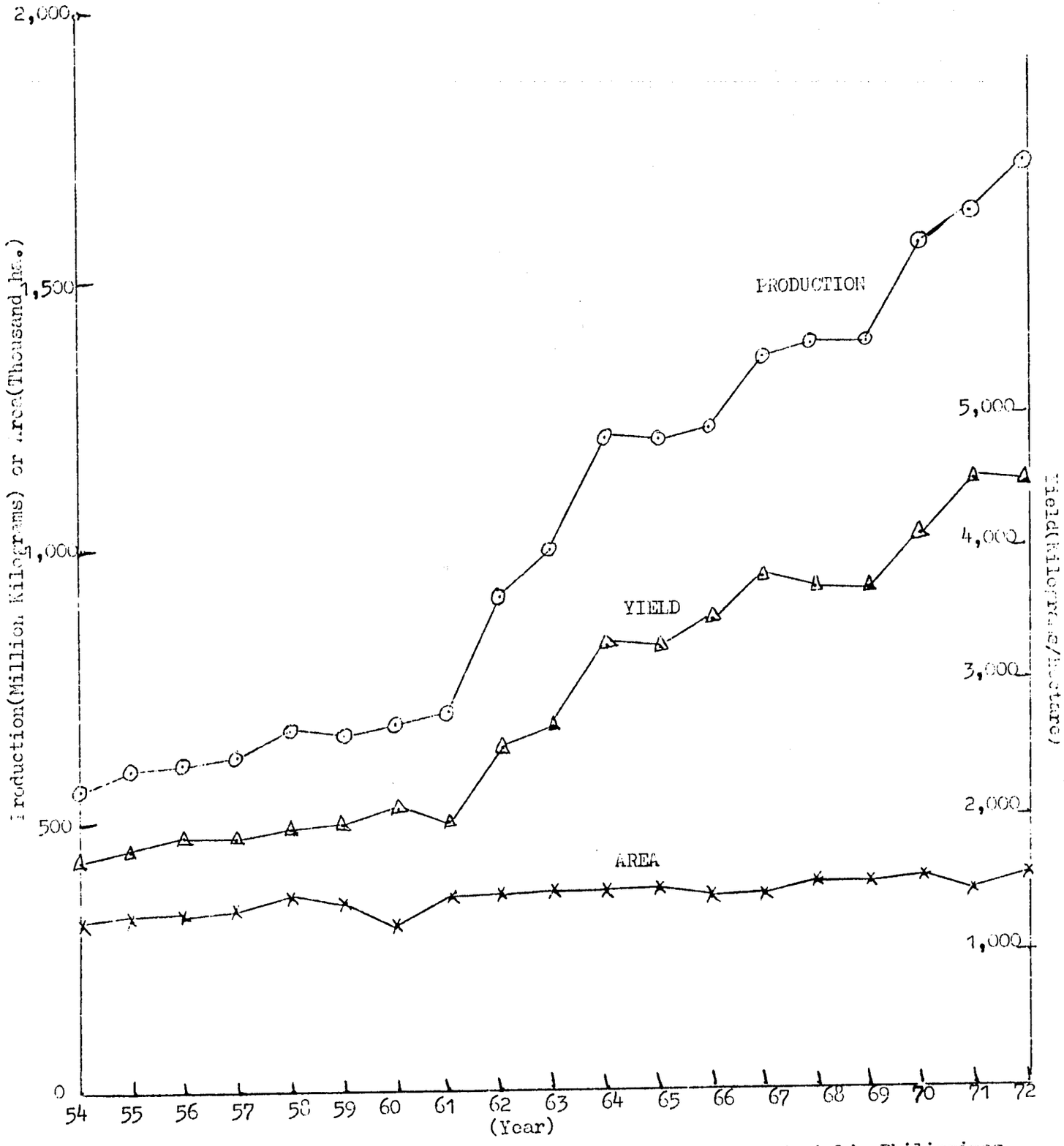

Fig. 5.1. Long-term trends in fruits and nuts production, area, and yield, Philippines, 1954-1972.

Table 5.2. Relative influence of area and yield on fruits and nuts production by year and region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Yield b/	LI c/ Term	Total
			Percent		
1954/57 to 1962/65					
Philippines	81.5	17.4	86.1	-3.5	100
Ilocos	21.7	-39.4	138.7	.7	100
C. Valley	162.4	-13.6	113.7	- .1	100
C. Luzon	46.4	41.2	59.9	-1.1	100
S. Tagalog	96.2	8.0	92.6	- .6	100
Bicol	49.1	46.5	54.1	- .6	100
E. Visayas	219.9	34.9	65.0	.1	100
W. Visayas	82.5	27.5	72.3	.2	100
NE Mindanao	72.5	-22.4	122.5	- .1	100
SW Mindanao	-16.2	108.7	- 8.6	- .1	100
1962/65 to 1969/72					
Philippines	44.5	5.2	95.1	- .2	100
Ilocos	26.7	-57.4	158.7	-1.3	100
C. Valley	47.2	38.8	61.0	.2	100
C. Luzon	83.6	8.1	91.3	.6	100
S. Tagalog	6.4	60.7	35.9	3.4	100
Bicol	-18.5	14.9	86.0	- .9	100
E. Visayas	-17.3	180.0	-79.7	- .3	100
W. Visayas	104.2	- 9.8	110.0	- .2	100
NE Mindanao	54.0	46.4	53.3	.3	100
SW Mindanao	250.6	42.0	57.9	.1	100
1954/57 to 1969/72					
Philippines	162.3	12.6	89.6	-2.2	100
Ilocos	54.1	-49.2	149.7	- .5	100
C. Valley	286.2	1.4	98.6	nil	100
C. Luzon	168.9	20.8	79.2	nil	100
S. Tagalog	108.9	12.4	87.8	- .2	100
Bicol	21.5	79.6	20.6	- .2	100
E. Visayas	164.6	6.6	93.4	nil	100
W. Visayas	272.5	7.3	92.7	nil	100
NE Mindanao	165.6	8.1	92.0	- .1	100
SW Mindanao	194.0	31.1	68.8	.1	100

a/ Computed by $\frac{\text{Log X}}{\text{Log P}} \times 100$ where: log X is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

crop in 1969. Also in abundance was mango in Ilocos and Southern Tagalog and pineapple in Cagayan, Bicol and the two Mindanao regions. Jackfruit was second to bananas in Eastern and Western Visayas.

Regional variations in production

For the period 1954/57 to 1962/65, all regions except Southern and Western Mindanao showed positive changes in production. On the other hand, for the period 1962/65 to 1969/72, Bicol and Eastern Visayas regions experienced decreases in production. Decreased production in Bicol was due to the negative changes in both area and yield while that in Eastern Visayas was due to the decrease in area alone (Table 5.1).

Yield exhibited a greater influence than area by showing positive production changes for the three periods considered in all regions except Southern Tagalog during the second period (1962/65 to 1969/72) and Bicol during the third period (1954/57 to 1969/72).

Furthermore, the relative influence of yield on production increases was more during the last decade compared to the previous decade (Table 5.2). Yield had also a greater influence than area on production changes in the national level.

Annual variations in production

All regions had relative stable production of fruits and nuts from 1954 to 1960. The succeeding years revealed rapid production increases in the two Mindanao and the two Visayas regions with Eastern Visayas showing the greatest fluctuation. There was a moderate upward production

Table 5.3. Relative contribution of various regions to total fruits and nuts production, Philippines, 1954-1972.

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	3.7	3.8	10.3	14.5	[illegible].3	12.5	12.8	19.0	14.1	100
1955	3.6	3.7	10.4	14.2	9.1	14.0	12.5	18.6	13.8	100
1956	3.6	3.7	10.5	14.2	9.1	13.9	12.5	18.6	13.9	100
1957	3.6	3.8	10.6	14.3	9.1	13.9	12.5	18.4	13.8	100
1958	3.6	3.7	10.6	14.3	9.1	13.9	12.5	18.5	13.8	100
1959	3.4	3.7	10.8	14.4	8.3	14.2	12.9	19.0	13.3	100
1960	3.5	4.0	12.1	14.6	10.4	9.8	11.2	22.6	11.8	100
1961	3.2	9.5	12.9	15.9	6.4	9.2	11.7	19.3	11.9	100
1962	2.9	3.5	10.6	15.8	7.6	23.2	13.7	16.4	6.3	100
1963	2.7	4.2	8.6	19.5	7.4	21.6	12.2	16.8	7.0	100
1964	2.3	5.3	7.3	13.3	6.6	29.8	12.7	17.3	5.4	100
1965	2.1	5.1	7.7	14.1	8.6	20.3	12.2	19.9	7.0	100
1966	1.8	7.5	7.5	14.1	9.7	19.1	13.0	19.1	8.2	100
1967	1.8	7.2	7.6	13.1	7.3	21.0	13.2	19.4	9.4	100
1968	1.5	8.7	8.3	13.4	5.0	14.8	17.2	19.4	11.7	100
1969	1.6	6.7	9.7	13.4	5.8	13.0	16.3	19.9	13.6	100
1970	1.4	6.2	11.2	12.9	4.9	11.6	22.0	17.6	12.2	100
1971	1.5	6.7	9.3	9.6	2.8	17.6	18.0	18.1	16.4	100
1972	0.8	5.9	12.6	10.2	3.8	12.3	15.2	19.8	19.4	100

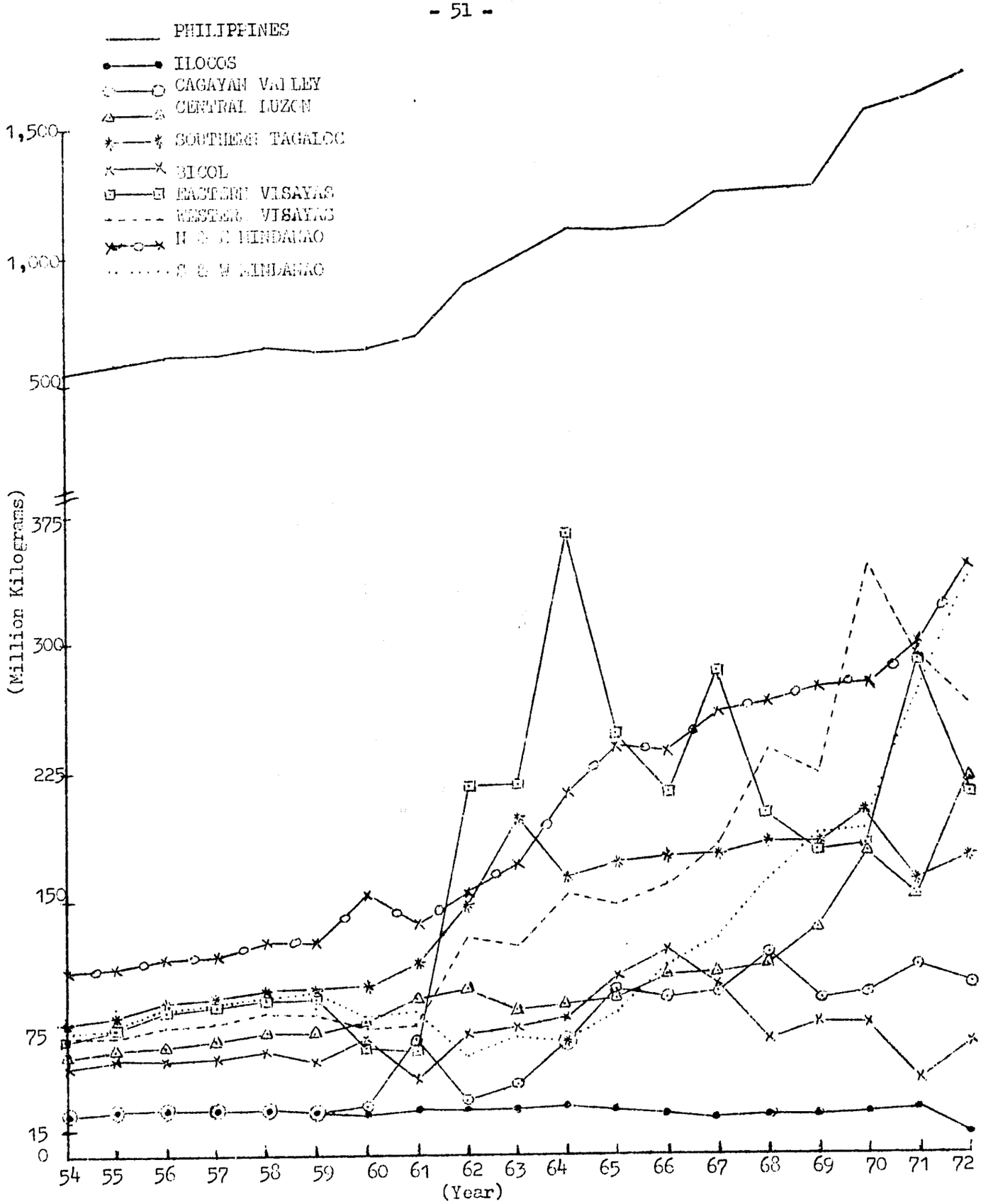

Fig. 5.2. Trends in fruits and nuts production by region, Philippines, 1954-1972.

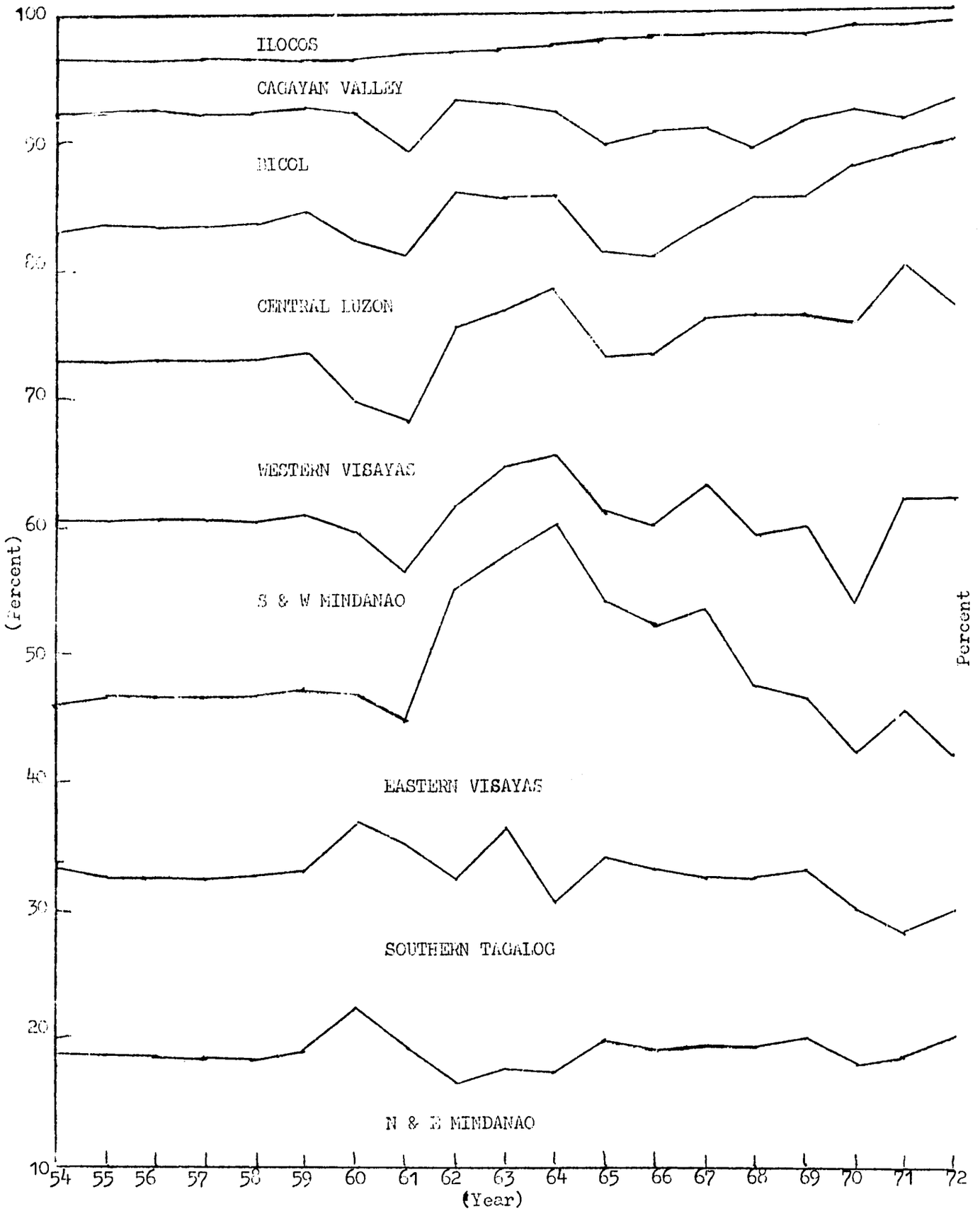

Fig. 5.3. Relative contribution of various regions to total fruits and nuts production, 1954-1972.

trend in Central Luzon and Southern Tagalog and a very slight increasing trend in the rest of the regions (Figure 5.2).

Cagayan Valley had the highest annual rate of growth of 8.6 per cent followed by Southern and Western Mindanao and Central Luzon with growth rates of 7.9 per cent and 7.3 per cent, respectively.

The relative contribution of Northern and Eastern Mindanao to total Philippine production of fruits and nuts was between 17 to 23 per cent which placed the region as top producer except in 1962/67 and 1970 during which Eastern Visayas had greatest relative contributions (Table 5.3 and Figure 5.3). The two Mindanao regions are the major exporters of bananas while Eastern Visayas account for a large proportion of mango production in the country.

For the first six years (1954/59) Eastern Visayas had a stable production, dropped during the next two years then became the highest contributor to the total production of fruits and nuts in 1962 to 1967.

The relative contribution of Southern and Western Mindanao to total production decreased from an about 14 per cent in 1954/61 to 5.4 per cent in 1964. However, the region's contribution jumped from 7.0 per cent in 1965 to 19.4 per cent in 1972.

Among the regions in Luzon, Southern Tagalog had the highest output ranging from 9.6 to 19.5 per cent of the total fruits and nuts production. Ilocos had the lowest relative contribution ranging from 1.5 to 3.7 per cent, only.

Table 5.4. Relative contribution of various regions to total fruits and nuts area, Philippines, 1954-1972.

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	4.6	4.2	12.8	18.1	8.7	14.5	14.4	13.0	9.7	100
1955	4.6	4.2	12.8	18.2	8.5	14.5	14.4	13.1	9.7	100
1956	4.6	4.2	12.8	18.2	8.5	14.5	14.5	13.1	9.6	100
1957	4.6	4.2	12.9	18.2	8.5	14.4	14.5	13.0	9.7	100
1958	4.6	4.2	12.9	18.2	8.5	14.5	14.5	13.0	9.6	100
1959	4.5	4.2	12.8	17.7	8.6	15.0	15.0	13.4	8.8	100
1960	4.4	4.0	15.8	18.2	9.5	11.8	15.2	12.7	8.4	100
1961	3.7	11.6	16.1	15.6	6.6	8.4	19.3	10.7	8.0	100
1962	3.7	4.2	13.8	15.3	7.5	22.5	17.6	9.4	6.0	100
1963	4.4	2.4	13.0	17.2	7.7	21.9	17.0	9.1	7.3	100
1964	3.9	2.9	14.8	19.1	10.6	16.3	13.8	11.2	7.4	100
1965	3.3	4.0	12.8	18.0	11.2	17.7	13.0	11.8	8.2	100
1966	3.4	4.5	13.3	17.2	12.1	16.1	14.2	10.4	8.8	100
1967	3.4	4.3	13.5	14.8	11.4	18.6	14.8	10.7	8.5	100
1968	2.7	4.1	12.7	18.9	9.2	16.8	15.4	10.2	10.0	100
1969	2.7	3.8	14.0	19.2	10.3	13.4	14.8	11.0	10.5	100
1970	2.8	3.8	14.9	18.4	10.2	13.1	15.0	11.0	10.8	100
1971	3.5	4.6	13.8	16.7	7.5	14.3	13.3	14.5	11.8	100
1972	3.1	4.1	13.2	16.8	7.5	14.0	13.4	13.5	14.4	100

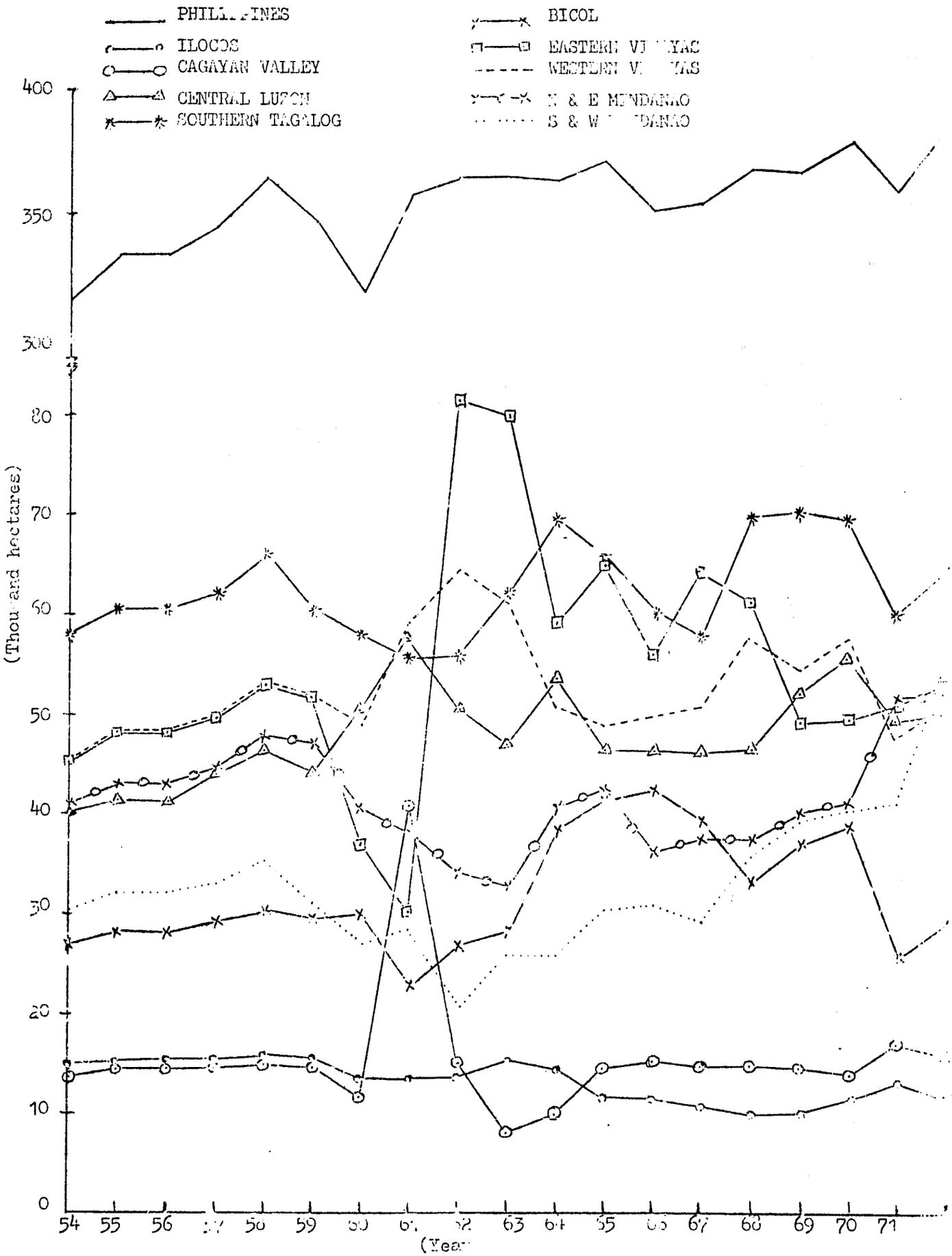

Fig. 5.4. Trends in fruits and nuts area by region, Philippines. 1954-1972.

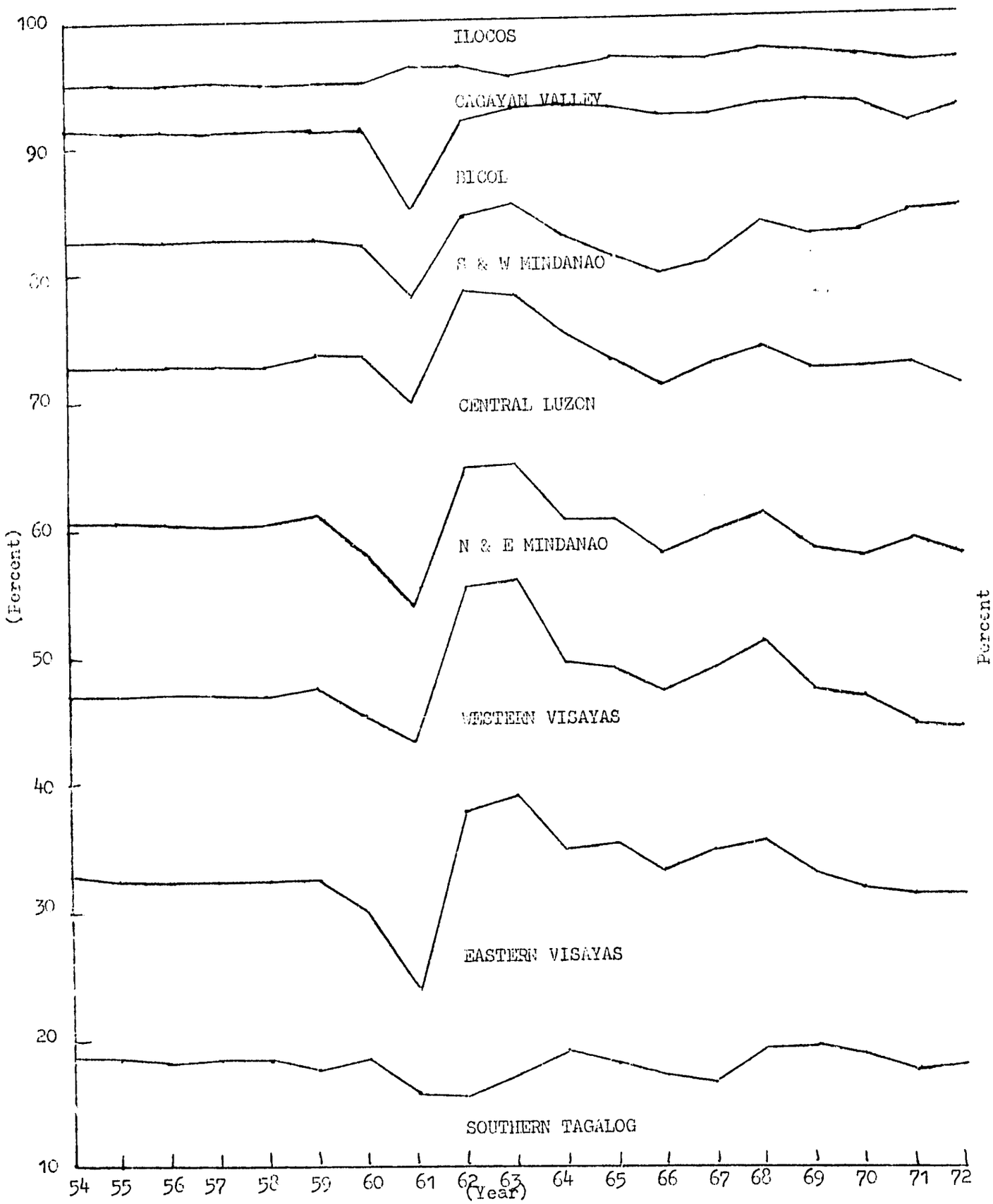

Fig. 5.5. Relative contribution of various regions to total fruits and nuts area, 1954-1972.

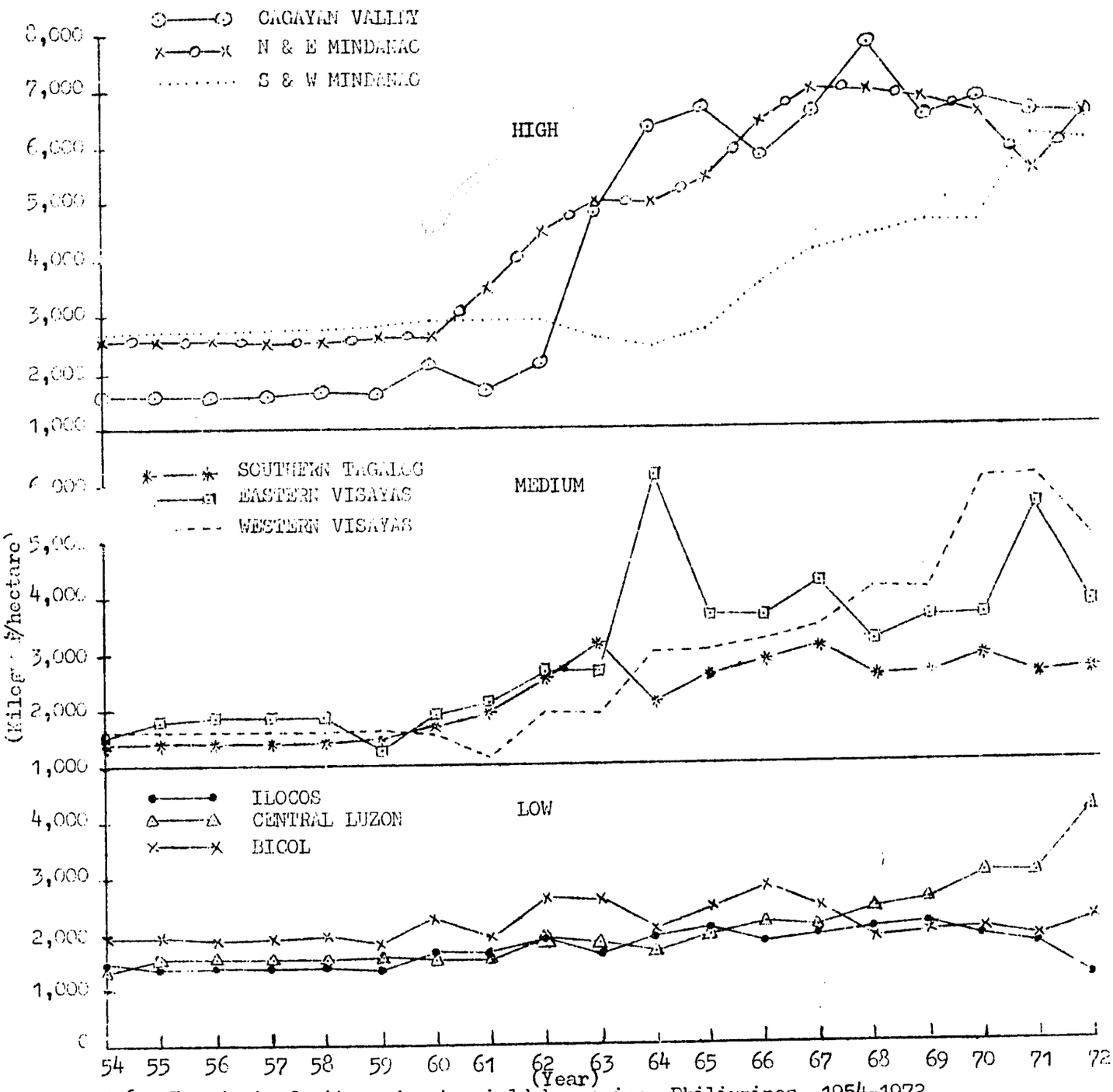

Fig. 5.6. Trends in fruits and nuts yield by region, Philippines, 1954-1972.

Area variations

Only Cagayan Valley and Eastern Visayas departed distinctly from the regional area trends. Both regions showed a decrease in area in 1960 followed by a tremendous increase in 1961 in the former and in 1962 in the latter region (Figure 5.4). Only Ilocos region had a decreasing annual growth rate in area.

Southern Tagalog had the highest relative contribution to total hectarage followed by Eastern Visayas. However, the former had a more stable production trend than the latter.

Yield variations

Yield of fruits and nuts in the Philippines had generally improved between 1954 to 1972. Cagayan Valley which had produced large quantities of bananas per hectare had the highest annual rate of growth, 7.7 per cent and Western Visayas, second with 6.5 per cent. Growth rates of yield in Ilocos and Bicol were less than one per cent annually.

On the average, the high yielding regions namely: Northern and Eastern Mindanao, Southern and Western Mindanao and Cagayan Valley more produced than 4,000 kilograms of fruits and nuts in a hectare (Fig. 5.5). On the other hand, the low yielding regions composed of Central Luzon, Ilocos, and Bicol yielded approximately 2,000 kilograms per hectare. The rest, considered medium yielding regions, gave an average yield of about 3,000 kilograms per hectare.

Table 5.5. Effects of regional area shifts on the national yield of fruits and nuts, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/62	1964/68	1969/72
	kilograms per hectare			
1954/58	1824.2	1785.1	1804.4	1845.2
1959/63	2138.0	2250.5	2287.1	2327.6
1964/68	3585.6	3580.2	3526.5	3571.4
1969/72	4040.4	4041.4	3923.1	4229.7
	yield index (1954/58 = 100)			
1954/58	100.0	97.9	98.9	101.2
1959/63	127.1	123.7	125.4	127.6
1964/68	196.6	196.3	193.3	195.8
1969/72	221.5	221.5	215.1	231.9

Effects of Regional Area Shifts on National Yield

The results of the analysis showed no consistent effect of the changes in regional area distribution on the national yield of fruits and nuts (Table 5.5). If 1954/58 yield had been constant during the four periods considered in the analysis, national yield would have decreased in 1959/63 and 1964/68 but would have increased in 1969/72. This suggests that production of fruits and nuts was more concentrated in the high yielding regions during the last four years than during the previous years.

The actual yields per hectare had increased from 1,824 kilograms in 1954/58 to 4,230 kilograms in 1969/72. If there had been no change in the 1954/58 regional acreage distribution, the 1969/72 yield in the Philippines would have been 4,040 kilograms per hectare only.

CHAPTER VI

ROOTCROPS

Rootcrops are one of the most easily grown foodcrops in the Philippines. They are commonly propagated by stem cuttings, by eye pieces and by corms. There are numerous uses of rootcrops. They are rich in carbohydrates and are used as supplements for rice and corn especially during lean months when the supply of these commodities is limited. They are also utilized for making native delicacies and as raw materials in industries.

National Changes in Rootcrops Production, Area and Yield

Except for 1962/63, production showed a moderately increasing trend from 1954 to 1964 after which it exhibited a downward trend until 1972. On the other hand, area showed a slightly decreasing but fluctuating trend throughout the 19-year period. The trend in yield was distinctly different from that of the area trend, i.e. as area increased, yield tended to decrease and vice versa (Figure 6.1).

Over the whole period, the annual rates of growth in production, yield and area were negligible. From 1954/57 to 1969/72 area decreased by 9.2 per cent but there was a 3.3 per cent increase in production which was influenced by the increase in yield of about 13.5 per cent (Table 6.1).

The analysis further shows that the decrease in national production for the period 1962/65 to 1969/72 was influenced more by area than yield (Table 6.2).

Table 6.1. Growth rates and periodical changes in rootcrops production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72
	per cent											
Philippines	0.2	17.2	-11.9	3.3	nil	2.2	-7.1	-9.2	0.4	19.8	-5.3	13.5
Ilocos	-2.3	-9.4	218.4	188.4	5.7	-46.4	111.1	13.0	4.0	69.2	50.8	155.2
C. Valley	3.4	127.0	-46.7	21.0	.6	-6.7	-30.8	-35.4	4.1	142.9	-22.9	87.2
C. Luzon	-4.1	18.1	-33.3	-26.3	-2.6	-14.8	-21.5	-33.1	-1.5	38.5	-15.0	17.7
S. Tagalog	-0.6	-9.7	-6.9	-16.0	-1.5	-20.4	-20.7	-36.9	1.0	13.4	17.4	33.2
Bicol	2.5	12.3	31.3	47.5	1.8	-8.4	28.0	17.2	.7	22.4	2.7	25.7
E. Visayas	-1.1	2.4	-24.8	-23.0	.7	26.2	-19.5	1.6	-1.8	-18.9	-6.6	-24.3
W. Visayas	-2.2	-13.6	-19.8	-30.6	-3.1	-16.9	-24.1	-36.9	.8	4.1	5.8	10.1
NE Mindanao	1.6	36.3	-3.3	31.9	1.2	9.5	13.2	23.9	.4	24.5	-14.4	6.5
SW Mindanao	-0.2	18.2	-24.5	-10.7	-1.8	-32.4	1.9	-31.1	1.7	74.8	-25.9	29.5

1/ Annual rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

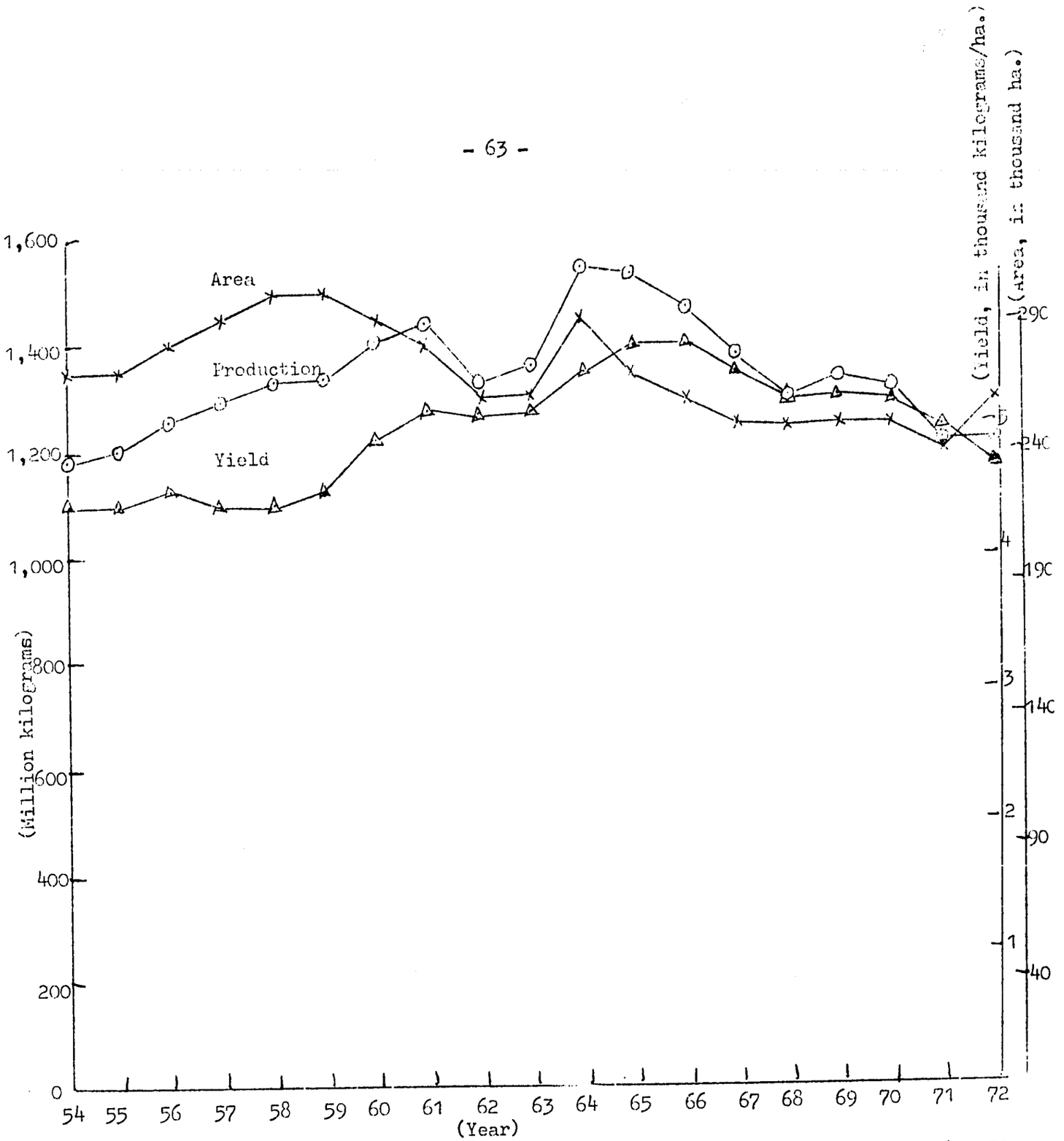

Fig. 6.1. Long-term trends in rootcrops production, area and yield, Philippines, 1954-1972.

Table 6.2. Relative influence of area and yield on rootcrops production by year and region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
		per cent			
1954/57 to 1962/65					
Philippines	17.2	-14.2	113.6	.6	100
Ilocos	9.4	632.8	-532.8	nil	100
C. Valley	127.0	-8.4	108.3	.1	100
C. Luzon	18.1	-96.3	196.4	-.1	100
S. Tagalog	- 9.7	222.9	-122.9	nil	100
Bicol	12.3	-75.6	174.2	1.4	100
E. Visayas	2.4	981.6	-884.5	2.9	100
W. Visayas	-13.6	127.2	-27.6	.4	100
NE Mindanao	36.3	29.3	70.7	nil	100
SW Mindanao	18.2	-233.9	333.7	.2	100
1962/65 to 1969/72					
Philippines	-11.9	57.7	42.5	-.2	100
Ilocos	218.4	64.5	35.5	nil	100
C. Valley	-46.7	58.6	41.4	nil	100
C. Luzon	-33.3	59.8	40.1	.1	100
S. Tagalog	-6.9	322.9	-222.9	nil	100
Bicol	31.3	90.6	9.6	-.2	100
E. Visayas	-24.8	76.0	24.0	nil	100
W. Visayas	-19.8	125.4	-25.6	.2	100
NE Mindanao	-3.3	-374.0	471.0	3.0	100
SW Mindanao	-24.5	-6.9	106.9	nil	100
1954/57 to 1969/72					
Philippines	3.3	-300.4	400.5	-.1	100
Ilocos	188.4	11.6	88.4	nil	100
C. Valley	21.0	-230.0	329.5	.5	100
C. Luzon	-21.3	167.8	-68.1	.3	100
S. Tagalog	-16.0	264.1	-164.5	.4	100
Bicol	47.5	40.9	58.8	.3	100
E. Visayas	-23.0	-6.0	106.3	-.3	100
W. Visayas	-30.6	126.1	-26.4	.3	100
NE Mindanao	31.9	77.6	22.7	-.3	100
SW Mindanao	10.7	328.5	-228.1	-.4	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

Regional Changes in Rootcrops Production, Area and Yield

Regional variations in production

Negative changes in production were observed from 1954/57 to 1962/65 in Southern Tagalog and Western Visayas while positive changes were noted from 1962/65 to 1969/72 in Ilocos and Bicol (Table 6.1). Table 6.2 shows that during the first period, changes in production in most regions were influenced more by yield but during the second period production changes were due more to changes in hectarage.

The top three rootcrops-producing regions were Eastern Visayas, Southern and Western Mindanao and Northern and Eastern Mindanao. The relative contribution to total rootcrops production of the first region ranged from 22 to 32 per cent; of the second, from 11 to 18 percent; and of the third region, from 10 to 15 per cent (Table 6.3 and Figure 6.3). Regions with the least contributions were Ilocos, Central Luzon and Southern Tagalog.

Annual variations in production

Figure 6.2 shows that trends in rootcrops production from 1954 to 1959 were slightly increasing in most regions. During the rest of the period, the two Mindanao regions exhibited minor fluctuations in production without any distinct trend. On the other hand, the two Visayas regions together with Southern Tagalog and Central Luzon showed moderately decreasing trend.

Table 6.3. Relative contribution of various regions to total rootcrops production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
						per cent				
1954	3.4	7.6	5.0	6.4	11.5	31.5	8.9	10.8	14.9	100
1955	3.4	7.6	4.9	6.4	11.5	31.5	[illegible].0	10.8	14.9	100
1956	3.4	7.7	5.0	6.4	11.5	31.5	8.9	10.7	14.9	100
1957	3.4	7.6	5.0	6.4	11.5	31.5	8.9	10.7	15.0	100
1958	3.4	7.6	5.0	6.4	11.5	31.5	8.9	10.8	14.9	100
1959	3.2	6.7	5.4	6.3	11.8	31.1	[illegible].0	11.1	14.8	100
1960	2.6	8.3	6.0	5.7	12.0	29.2	8.8	11.8	15.6	100
1961	2.3	7.8	6.2	8.1	8.0	32.3	6.8	15.1	13.4	100
1962	2.4	14.0	5.7	5.2	10.2	29.5	6.8	14.6	11.6	100
1963	3.3	15.3	5.1	5.2	11.7	28.6	5.9	10.4	14.5	100
1964	2.5	14.7	4.5	4.7	10.6	27.2	6.8	12.7	16.3	100
1965	2.4	15.1	4.9	4.6	11.6	24.9	6.8	12.3	17.4	100
1966	[illegible].1	15.5	5.2	5.0	13.5	22.0	6.8	12.0	17.9	100
1967	2.2	16.1	5.5	5.7	13.4	22.9	6.5	13.7	14.0	100
1968	2.3	16.2	5.9	5.1	13.5	23.9	6.7	11.6	14.8	100
1969	2.2	15.2	5.8	4.8	16.2	23.2	6.5	12.0	14.1	100
1970	2.8	19.0	4.9	4.9	15.0	21.9	6.6	14.3	10.6	100
1971	2.4	15.9	2.0	5.5	16.9	24.2	5.2	14.8	13.1	100
1972	2.1	14.1	2.3	5.5	17.9	24.6	5.6	13.9	14.0	100

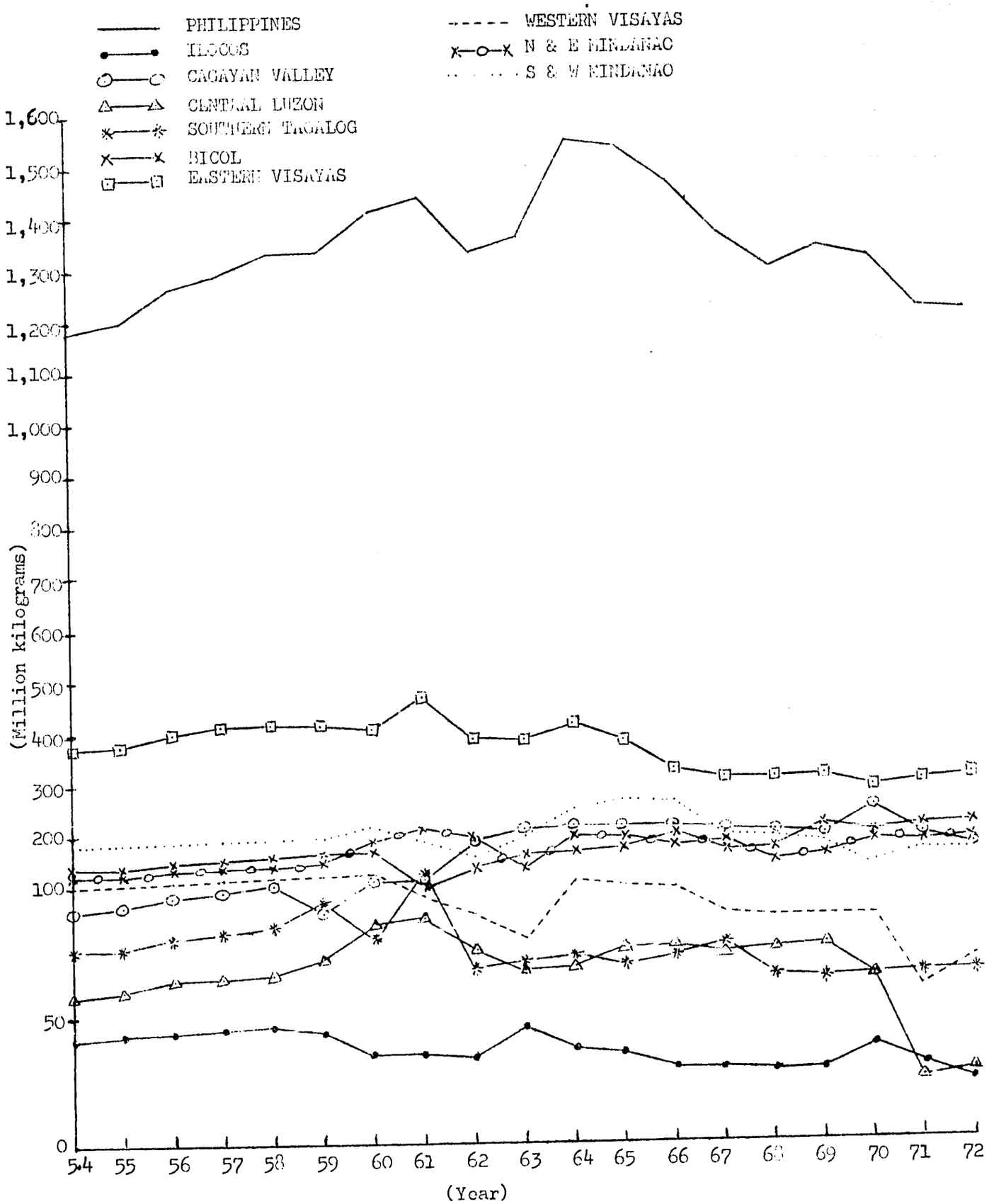

Fig. 6.2. Trends in rootcrop production by region, Philippines, 1954-1972

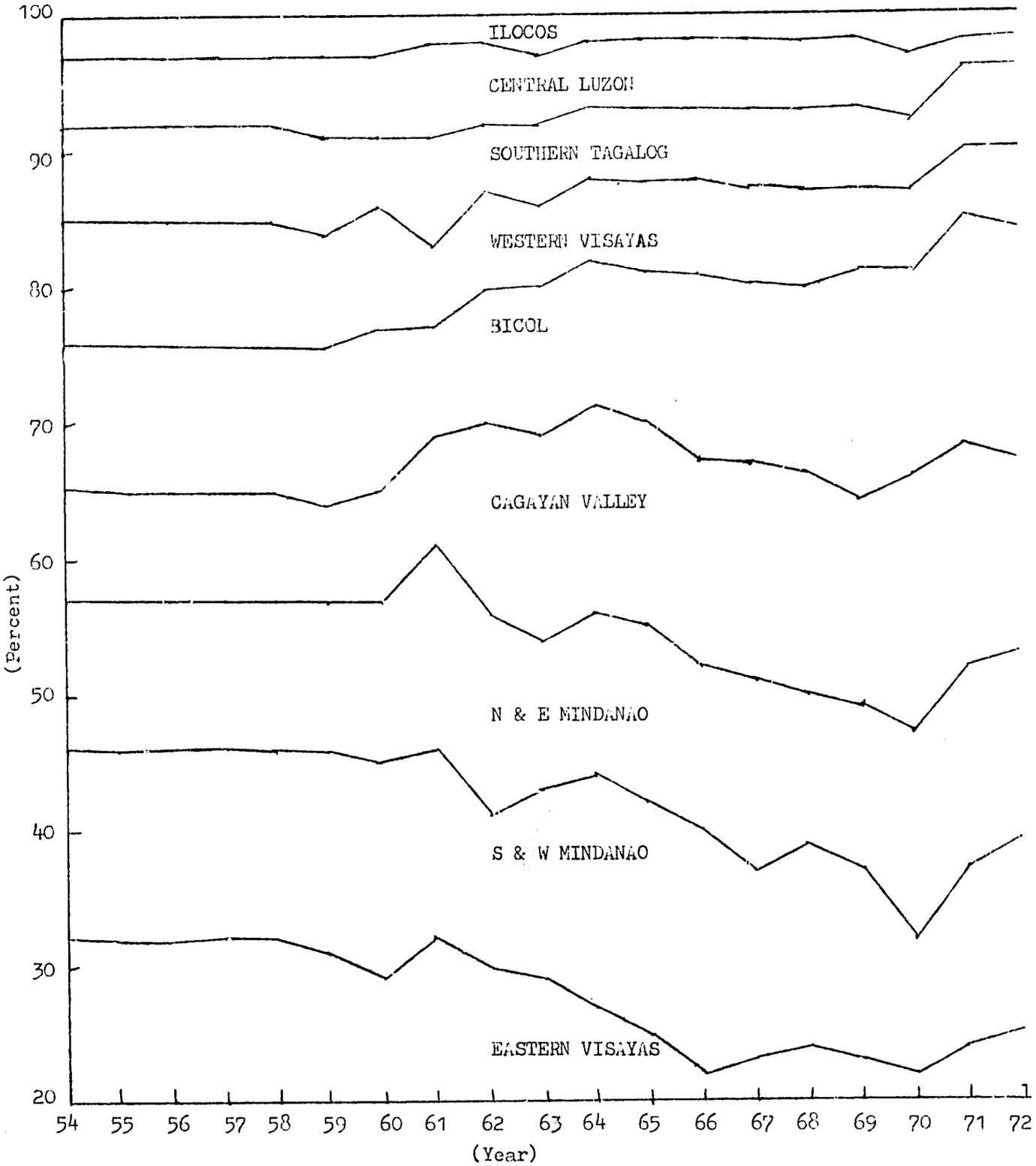

Fig. 6.3. Relative contribution of various regions to total rootcrops production, Philippines, 1954-1972.

Area variations

During the first four years, there was a moderate but consistent upward area trend in all regions. In subsequent years, however, hectarage in Ilocos, Central Luzon, Southern Tagalog and Western Visayas exhibited decreasing trends. Only Bicol and Northern and Eastern Mindanao showed upward area trends from 1964 to 1972. Eastern Visayas had the greatest relative contribution to total rootcrops area. On the other hand, among the nine regions, Ilocos and Central Luzon had the least contribution to rootcrops area.

Yield variations

All regions except Eastern Visayas and Central Luzon exhibited increasing productivity over the whole period (Figure 6.6). These two regions had negative growth rates in yield of about 2 per cent per year.

Regions with high yield namely: Ilocos, Cagayan Valley, and Southern and Western Mindanao showed tremendous yield increases from 4,162; 3,718 and 5,098 to 7,403; 9,127 and 8,664 kilograms per hectare, respectively during the first ten years after which yield decreased rapidly in the last two regions. Medium-yielding region like Southern Tagalog, Bicol and Central Luzon had stable yields from 1954 to 1959, fluctuating but generally increasing yield from 1960 to 1970, and declining yields the last two years. Eastern Visayas, Western Visayas and Northern and Eastern Mindanao were considered low-yielding regions. This result indicates that the

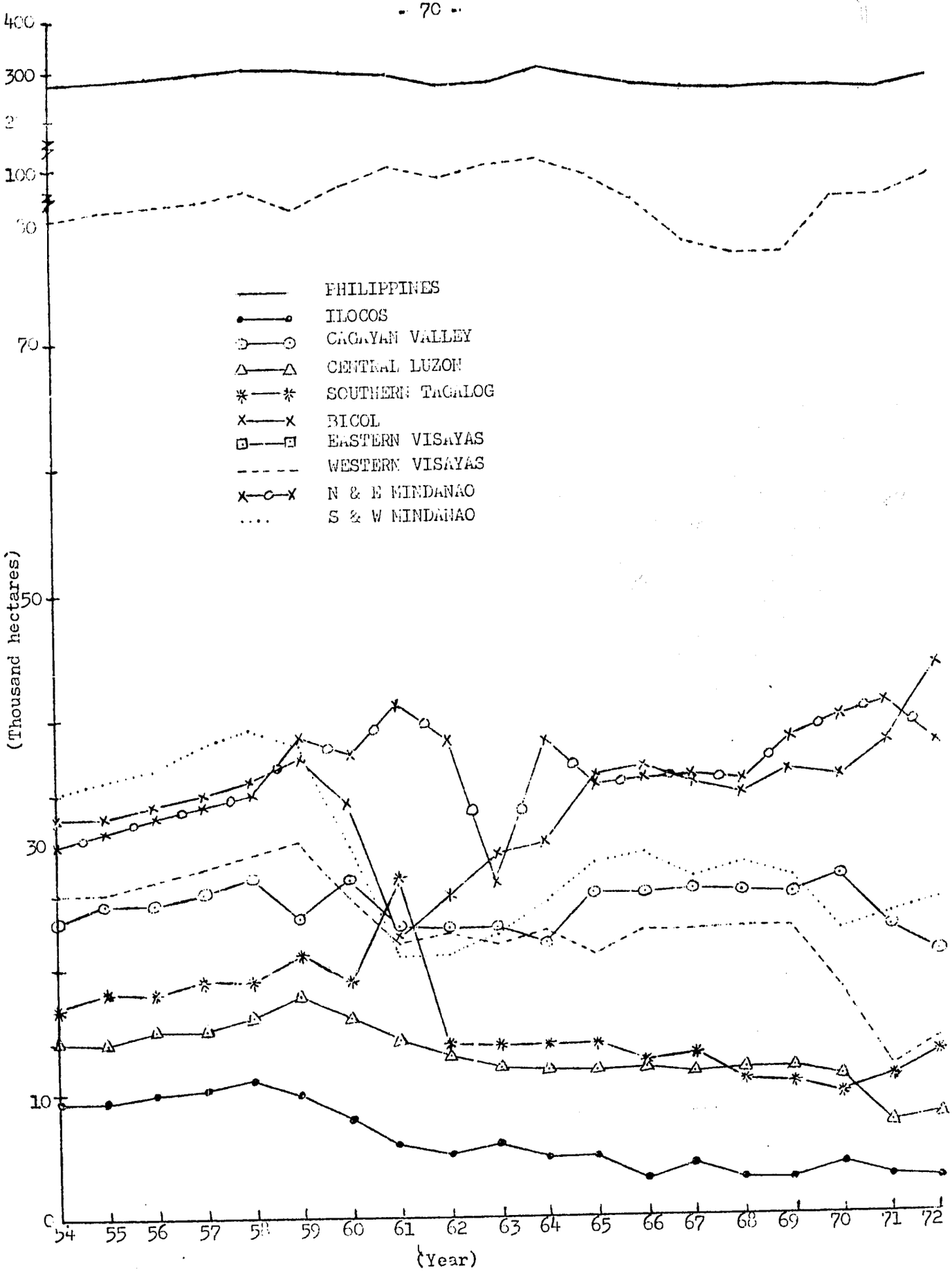

Fig. 6.4. Trends in rootcrops area by region, Philippines, 1954-1972

Table C.4. Relative contribution of various regions to total rootcrops area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
						per cent				
1954	3.6	9.1	5.2	6.4	11.9	29.9	9.6	11.4	12.9	100
1955	3.6	9.0	5.2	6.4	11.8	29.9	9.6	11.6	12.9	100
1956	3.6	9.1	5.2	6.4	11.8	29.9	9.6	11.5	12.9	100
1957	3.6	9.1	5.2	6.4	11.8	29.9	9.6	11.5	12.9	100
1958	3.6	9.1	5.2	6.4	11.8	29.9	9.6	11.5	12.9	100
1959	3.3	8.1	5.9	6.9	12.4	28.0	9.9	12.6	12.9	100
1960	2.7	9.3	5.5	6.7	11.6	31.7	9.1	12.9	10.5	100
1961	1.9	8.3	5.1	9.5	8.3	37.0	7.7	14.6	7.6	100
1962	1.9	8.8	5.0	5.5	10.1	36.9	8.7	14.7	8.4	100
1963	2.3	8.6	4.7	5.4	10.9	40.9	8.4	10.2	8.6	100
1964	1.8	7.7	4.2	4.9	10.4	41.3	7.8	13.3	8.6	100
1965	1.8	9.5	4.4	5.1	12.9	35.4	7.7	12.9	10.3	100
1966	1.3	9.8	4.6	4.7	13.6	32.7	8.9	13.4	11.0	100
1967	1.4	10.3	4.7	5.2	13.8	30.8	9.2	13.9	10.7	100
1968	1.3	10.4	4.9	4.5	13.7	30.9	9.3	13.8	11.2	100
1969	1.2	10.1	4.9	4.3	14.3	30.4	8.9	15.1	10.8	100
1970	1.5	10.6	4.3	4.2	13.9	33.2	7.0	16.0	9.3	100
1971	1.3	9.2	2.9	4.4	15.6	34.9	5.1	16.7	9.9	100
1972	1.1	8.4	3.2	4.9	17.1	35.6	5.5	14.7	9.5	100

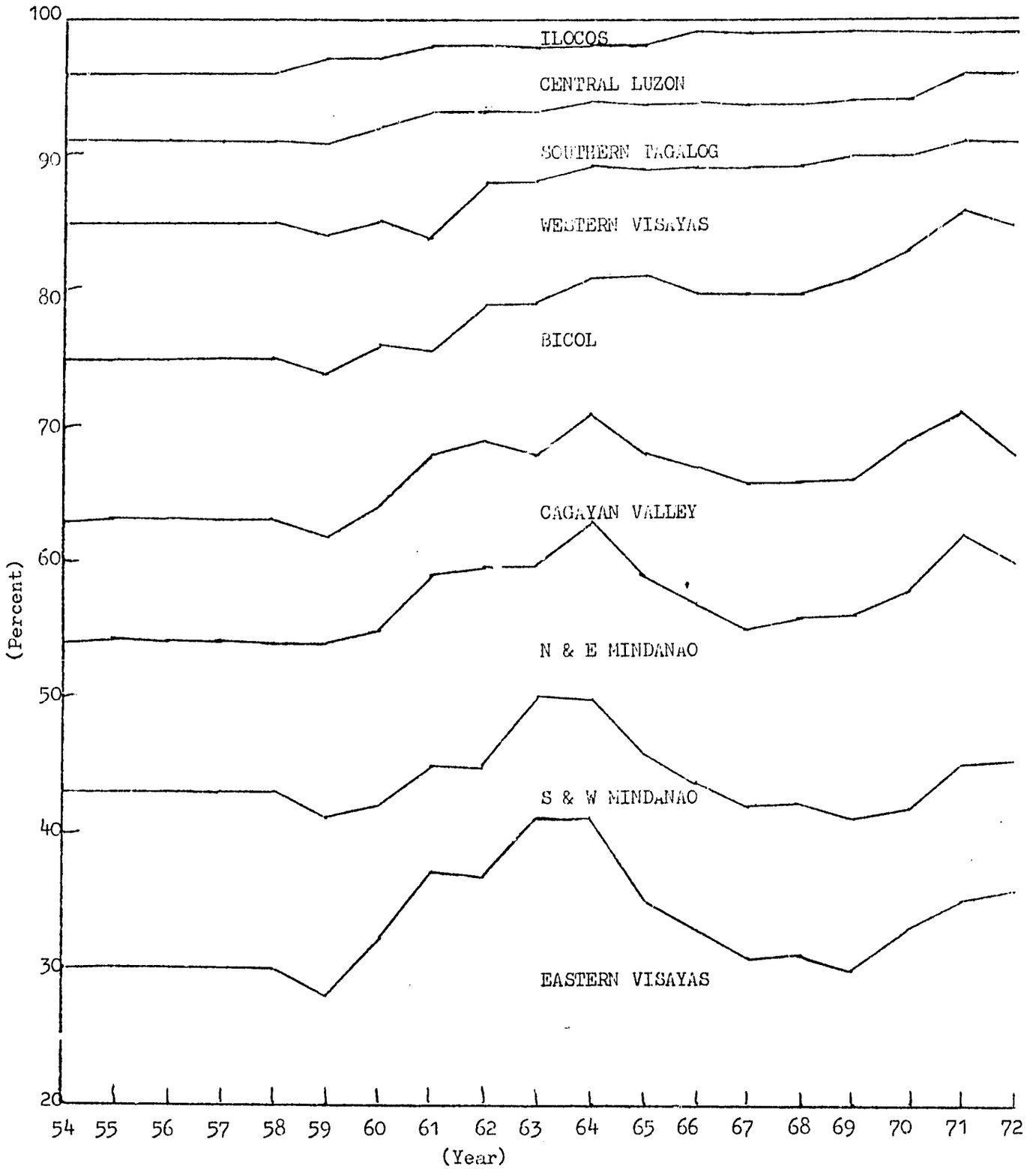

Fig. 6.5. Relative contribution of various regions to total rootcrops area, Philippines, 1954-1972.

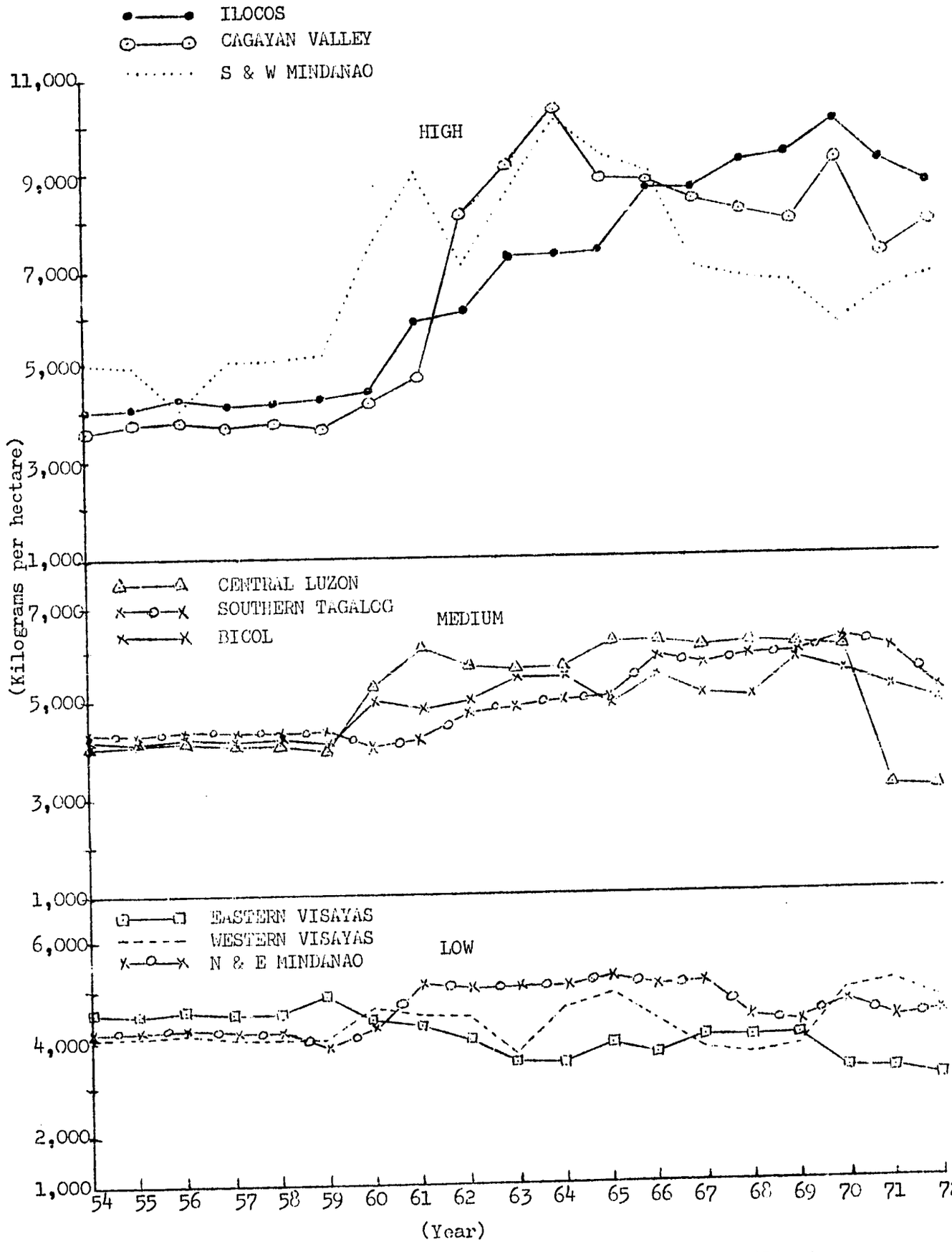

Fig. 6.6. Trends in rootcrops yields in various regions, Philippines, 1954-1972

Table 6.5. Effects of regional area shifts on the national yield of rootcrops, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	4,435.8	4,427.7	4,427.8	4,418.5
1959/63	5,046.2	4,929.9	4,959.2	4,966.5
1964/68	5,650.0	5,430.8	5,451.9	5,462.7
1969/72	5,215.2	5,021.5	5,013.9	5,024.9
	yield index (1954/58 = 100)			
1954/58	100.0	99.8	99.8	99.6
1959/63	113.8	111.1	111.8	112.0
1964/68	127.4	122.4	122.9	123.2
1969/72	117.6	113.2	113.0	113.3

low national yield of rootcrops was primarily due to the relatively low yield in Eastern Visayas; this region having the lowest yield but with the largest rootcrops area.

Effects of Regional Area Shifts on National Yield

Apparently, changes in hectarage distribution of rootcrops among the various regions during the 19-year period had a declining effect on the national yield (Table 6.5). If regional yields in 1954/58 had remained constant, national yield would have slightly decreased by 0.4 of one per cent in 1969/72. On the other hand, had there been no change in the 1954/58 acreage distribution, the national yield per hectare would have increased from 4,436 kilogram in 1954/58 to 5,215 kilograms or about 18 per cent in 1969/72. This would have been 4 per cent higher than the actual increase in the national yield. The result implies that to some extent, rootcrops area shifted from the high yielding to the low yielding regions during the 19-year period under review.

CHAPTER VII

CACAO AND COFFEE

Cacao and coffee are two of the leading beverages and delicacies of most Filipinos. Before the 20th century, these crops had been one of the exports of the country. Internationally, Philippine coffee has also a wider market and a better bargaining power than other coffee exporting countries.[9/]

An earlier analysis on post-war trends in coffee production, area and yield showed increases in all regions. The rate of growth in coffee production was highest in Western Visayas and in Ilocos region. Total production was highest in Southern Tagalog, which together with the two Mindanao regions contributed 84 percent of the total coffee output.[10/]

National Changes in Cacao and Coffee Production, Area and Yield

Trends in production, area and yield per hectare were characterized by (1) gradual increases from 1954 to 1960, (2) abrupt increases from 1960 to 1962, and (3) decreases in 1963 followed by slight fluctuation nd upward movement up to 1972. During the 19-year period, the annual rates of growth in production, area and yield were 11.1, 5.1 and 5.7, respectively (Figure 7.1 and Table 7.1).

[9/] Philippines Recommends for Coffee, PCARR, 1976

[10/] P. Castillo, "Post-War Trend in Production, Consumption and Prices of Coffee," M.S. Thesis, UPLB, 1969.

Table 7.1. Growth rates and periodical changes in cacao and coffee production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57 1962/65:1969/72:1969/72			Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57 1962/65:1969/72:1969/72			Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57 1962/65:1969/72:1969/72		
	per cent											
Philippines	11.1	403.1	20.9	508.1	5.1	107.3	14.2	136.6	5.7	142.4	6.3	157.6
Ilocos	11.6	-12.2	507.3	433.4	-2.0	-22.5	-14.6	-33.8	13.9	13.3	602.9	696.7
C. Valley	15.9	1225.2	6.6	1308.7	5.4	85.2	36.5	152.8	10.0	6.2	-23.1	458.3
C. Luzon	7.2	117.2	50.2	226.2	6.3	216.4	2.5	208.6	.9	-32.0	58.8	8.0
S. Tagalog	7.7	179.2	21.1	238.1	4.3	84.2	5.7	94.6	3.3	53.7	14.3	75.6
Bicol	9.4	434.2	74.1	830.2	6.8	84.3	103.1	274.3	2.5	195.6	-14.7	152.2
E. Visayas	5.5	202.0	-11.6	167.1	2.0	64.9	-17.2	36.6	3.4	84.0	6.5	96.0
W. Visayas	9.3	603.2	-25.7	422.5	4.2	173.6	-11.8	141.2	4.8	152.6	-14.6	115.8
NE Mindanao	10.6	563.6	-22.0	417.8	4.9	123.6	5.9	136.8	5.4	197.3	-26.4	118.9
SW Mindanao	15.6	476.0	113.2	1128.1	6.9	124.7	37.6	209.2	8.1	156.7	55.8	300.0

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

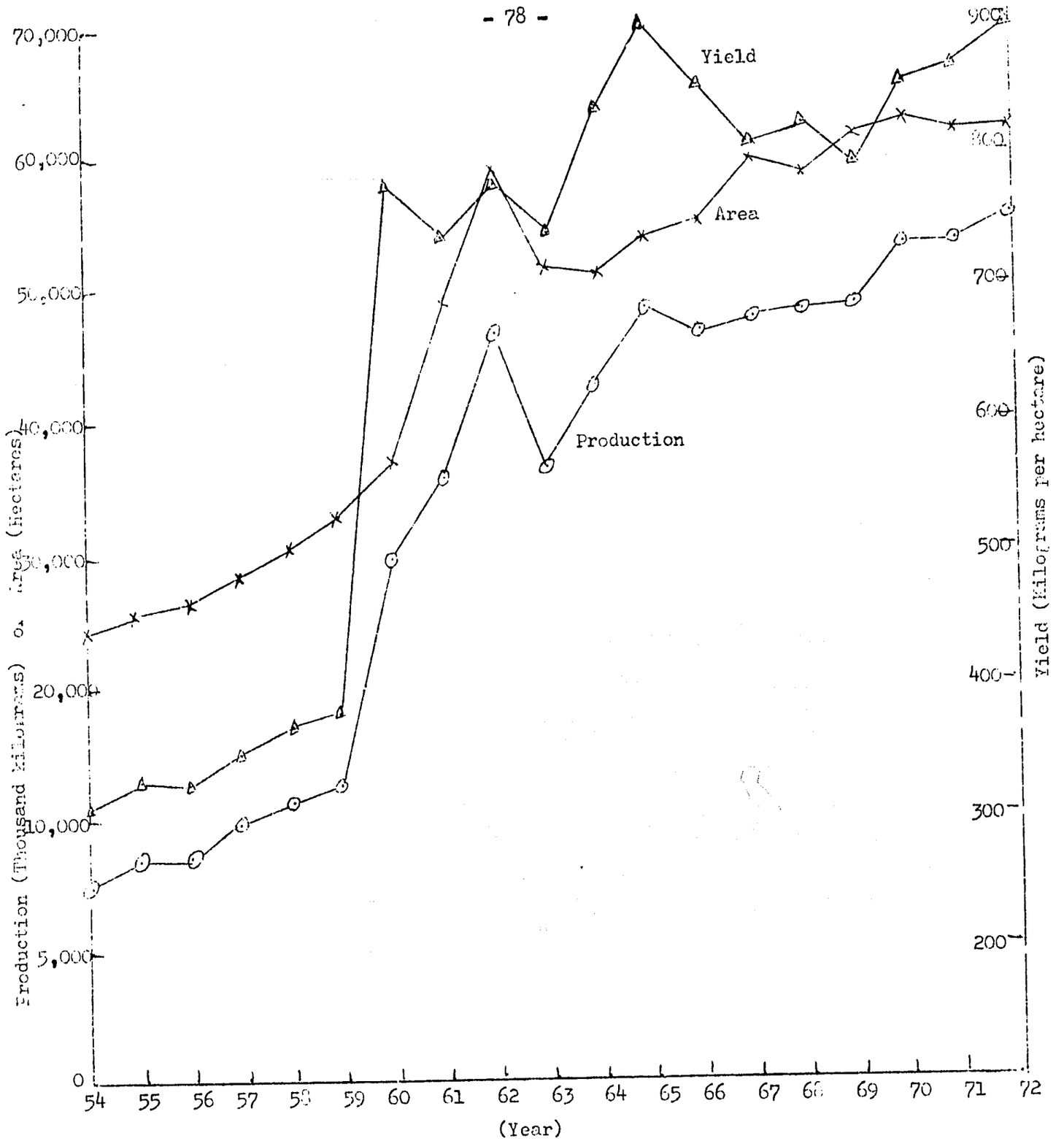

Fig. 7.1. Long-term trends in cacao and coffee production, area and yield, Philippines, 1954-1972

Table 7.2. Relative influence of area and yield on cacao and coffee production by year and by region, Philippines, 1954-1972

	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
		per cent			
1954/57 to 1962/65					
Philippines	403.1	45.1	54.9	nil	100
Ilocos	-12.2	196.1	-96.4	.3	100
C. Valley	1223.2	23.9	76.2	-.1	100
C. Luzon	117.2	148.5	-48.7	.2	100
S. Tagalog	179.1	59.4	41.2	-.6	100
Bicol	434.2	36.5	63.5	nil	100
E. Visayas	202.0	45.2	55.2	-.4	100
W. Visayas	603.2	51.6	48.4	nil	100
NE Mindanao	563.6	42.5	57.6	-.1	100
SW Mindanao	476.0	46.2	53.8	nil	100
1962/65 to 1969/72					
Philippines	20.9	69.9	30.1	nil	100
Ilocos	507.3	- 8.7	108.7	nil	100
C. Valley	6.6	497.8	-398.2	.4	100
C. Luzon	50.2	- 6.2	106.2	nil	100
S. Tagalog	21.1	28.7	71.3	nil	100
Bicol	74.1	127.8	-28.6	.8	100
E. Visayas	11.6	153.2	-53.2	nil	100
W. Visayas	-25.7	42.4	57.6	nil	100
NE Mindanao	-22.0	-22.9	122.7	.2	100
SW Mindanao	113.2	42.2	58.6	-.8	100
1954/57 to 1969/72					
Philippines	508.1	47.7	52.3	nil	100
Ilocos	433.4	-24.6	124.0	-.3	100
C. Valley	1308.7	35.1	65.0	-.1	100
C. Luzon	226.2	95.3	4.5	.2	100
S. Tagalog	238.1	54.6	46.2	-.8	100
Bicol	830.2	59.2	41.5	-.7	100
E. Visayas	167.1	31.7	68.5	-.2	100
E. Visayas	422.5	53.3	46.5	.2	100
NE Mindanao	417.8	52.4	47.6	nil	100
SW Mindanao	1128.1	45.0	55.0	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ Where: log Y is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

A remarkable increase (403.1%) in the production of cacao and coffee was noted from 1954/57 to 1962/65. This was an off-shoot of the more than 197.3 and 142.4 per cent increases in area and yield, respectively during the same period. In contrast, the national production of coffee and cacao increased by about twenty-one per cent only for the period 1962/65 to 1969/72 owing to the relatively low area (14.2%) and yield (6.3%) increases. From 1954/57 to 1969/72 the country's cacao and coffee production increased tremendously due to great increases in both area and yield (Table 7.1).

Regional Changes in Cacao and Coffee Production, Area and Yield

Regional variations in production

All regions had positive growth rates in production with Cagayan Valley and Southern and Western Mindanao having the highest. For the period 1954/57 to 1962/65, all regions except Ilocos showed marked increases in production, (Table 7.1). On the other hand, the two Visayas regions and Northern and Eastern Mindanao decreased in production from 1962/65 to 1969/72.

Table 7.2 shows that during the first period (1954/57 to 1962/65), changes in production in Cagayan Valley, Bicol, Eastern Visayas and the two Mindanao regions were influenced more by changes in yield than in area. Likewise, yield changes rather than area changes had greater influence on production changes in all regions except Cagayan Valley, Bicol, and Eastern Visayas during the second period (1962/65 to 1969/72). Changes in production in these three regions were affected more by area than yield.

Table 7.3. Relative contribution of various regions to total cacao and coffee production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	1.0	5.2	1.1	39.1	3.2	4.2	5.3	24.9	15.4	100
1955	1.0	5.1	1.0	39.3	3.0	3.8	5.2	24.6	16.4	100
1956	1.5	5.2	1.1	39.3	3.0	4.0	5.2	25.1	15.6	100
1957	1.5	5.1	1.0	39.6	3.0	3.6	5.1	24.8	16.3	100
1958	1.4	5.1	1.0	40.0	2.6	3.5	5.0	24.0	16.2	100
1959	1.1	4.6	1.0	42.0	2.6	3.0	6.2	23.9	13.8	100
1960	0.7	4.4	0.7	28.8	2.8	2.7	11.0	25.3	23.6	100
1961	0.3	5.3	0.4	28.8	3.6	1.7	14.8	22.1	23.0	100
1962	0.3	5.5	0.4	21.2	1.3	3.1	10.5	41.7	16.0	100
1963	0.4	12.2	0.6	24.4	4.2	2.1	7.1	20.2	20.0	100
1964	0.3	16.6	0.4	21.0	3.3	2.1	6.0	33.8	16.5	100
1965	0.1	19.7	0.4	21.3	4.2	2.0	5.2	26.8	20.3	100
1966	0.1	20.4	0.5	19.8	6.3	1.4	5.0	20.1	26.6	100
1967	0.1	19.9	0.6	19.3	7.8	1.4	4.7	21.4	25.8	100
1968	0.1	14.5	0.6	18.4	6.5	1.4	4.8	20.3	33.4	100
1969	0.1	13.7	0.5	20.6	6.4	1.6	5.3	19.8	32.0	100
1970	1.8	11.7	0.7	24.3	7.2	1.8	4.7	17.8	30.0	100
1971	1.6	10.9	0.4	20.6	2.8	1.3	4.0	23.8	34.0	100
1972	1.7	11.6	0.5	21.9	2.4	1.6	3.9	23.0	33.4	100

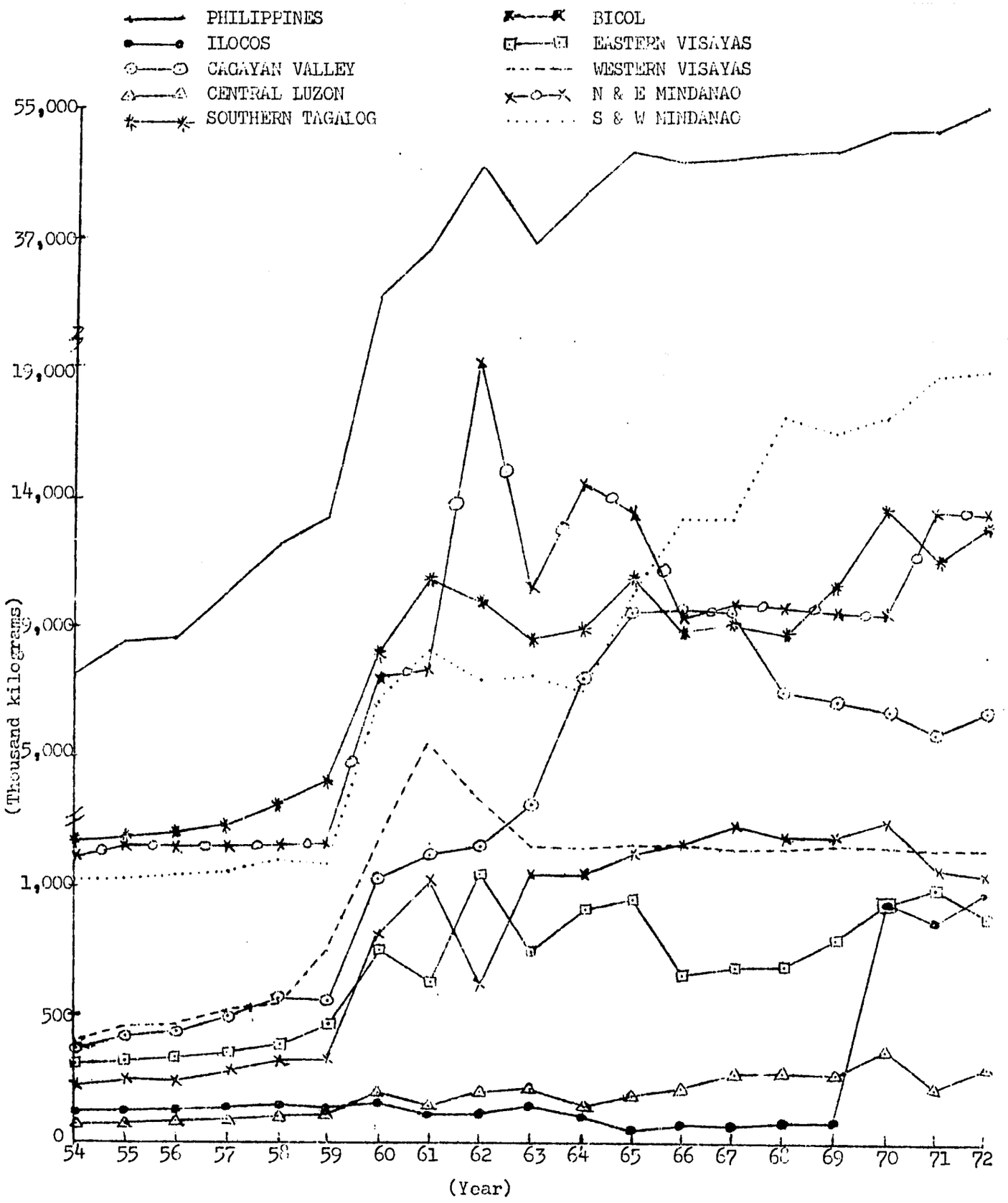

Fig. 7.2. Trends in cacao and coffee production by region, Philippines, 1954-1972

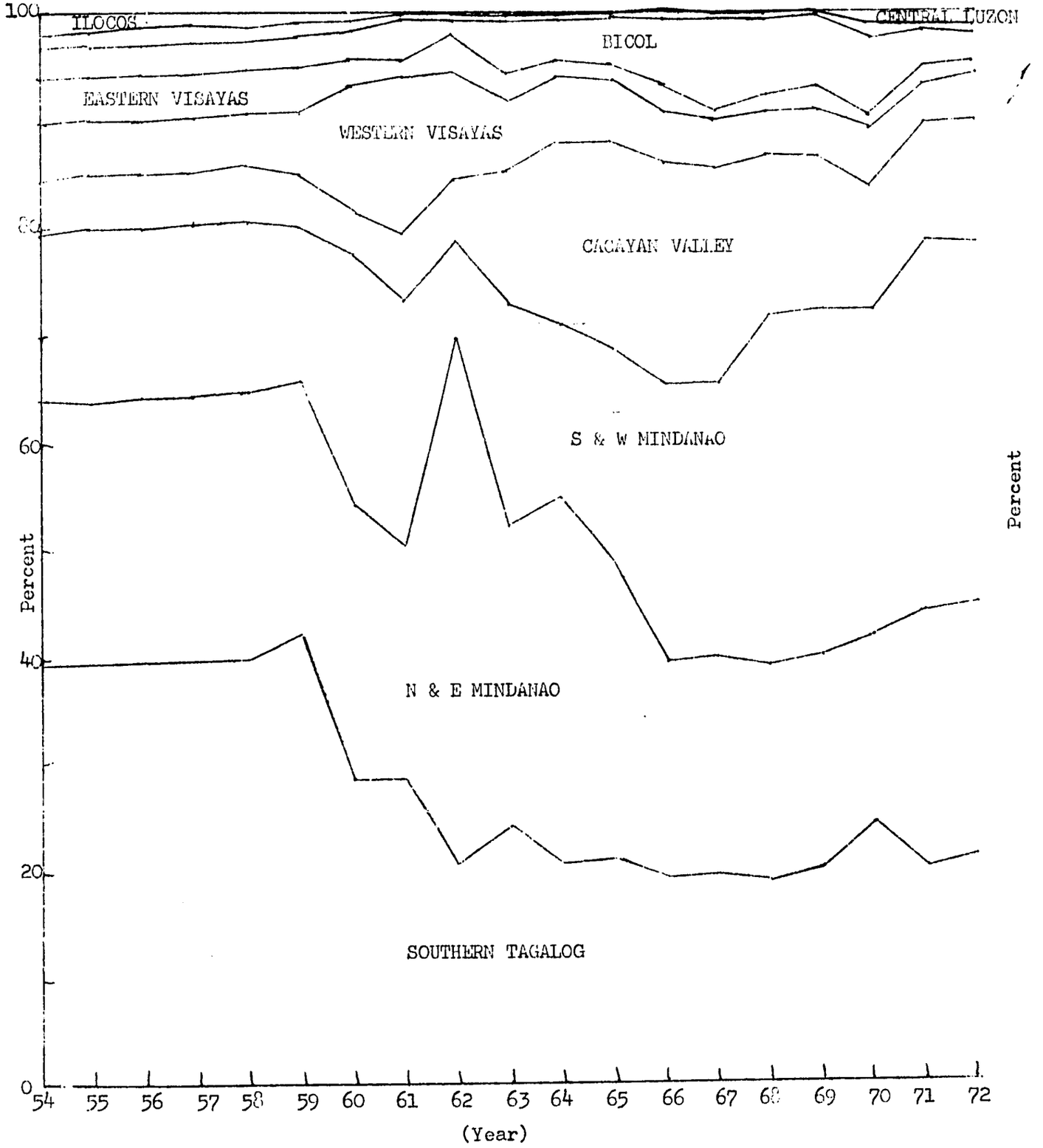

Fig. 7.3. Relative contribution of various regions to total cacao and coffee production, Philippines, 1954-1972

Annual variations in production

Trends in cacao and coffee production of all regions were relatively stable from 1954 to 1959 and were fluctuating but generally increasing from 1960 to 1965 except Ilocos and Central Luzon (Fig. 7.2). From 1966 to 1972, Ilocos, Southern Tagalog and the two Mindanao regions showed marked increases in production while Central Luzon, Bicol and the two Visayas regions exhibited very slight production increases. Cagayan Valley decreased in production during the same period.

Southern Tagalog was the top producer of cacao and coffee from 1954 until 1961 when it was displaced by Northern and Eastern Mindanao. Southern and Western Mindanao, however, had the greatest contribution to cacao and coffee production from 1966 to 1972. These three regions contributed more than three-fifths of the total cacao and coffee production throughtout the period.

Another region which somehow showed an improvement in production was Cagayan Valley. From a relative contribution of 5.5 per cent in 1962, the region's contribution increased steadily until 1966 when it reached 20.4 per cent. The trend, however, decreased again after 1966. Regions with the least contribution to total production were Ilocos and Central Luzon.

Area variations

National acreage devoted to cacao and coffee increased considerably up to 1962 after which it dropped in 1963, then increased moderately during the succeeding years (Figure 7.4).

Table 7.4. Relative contribution of various regions to total cacao and coffee area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	1.8	7.0	1.4	30.9	4.4	5.3	9.4	22.3	17.5	100
1955	1.7	7.2	1.3	31.5	4.3	5.1	9.1	22.2	17.6	100
1956	1.7	7.1	1.3	31.6	4.3	5.0	9.1	22.2	17.7	100
1957	1.7	7.1	1.3	31.8	4.3	4.9	9.0	22.2	17.7	100
1958	1.7	7.1	1.3	31.9	4.3	4.9	8.9	22.3	17.6	100
1959	1.3	7.2	1.1	33.8	3.9	5.5	8.9	21.6	16.7	100
1960	1.2	5.3	1.4	32.7	3.5	5.3	13.1	19.7	17.8	100
1961	0.8	7.1	1.4	30.0	3.7	3.8	14.2	17.6	21.4	100
1962	0.7	5.8	1.3	23.6	2.6	4.5	11.4	32.5	17.6	100
1963	0.9	6.6	2.4	29.9	3.9	4.4	12.6	18.9	20.4	100
1964	0.7	5.9	2.3	31.5	4.2	4.4	12.[illegible]	19.9	18.3	100
1965	0.4	7.2	2.2	27.5	4.3	2.9	11.6	23.5	19.9	100
1966	0.3	6.8	2.5	27.8	4.9	2.9	12.1	22.7	20.[illegible]	100
1967	0.4	5.9	2.3	25.1	5.9	2.9	11.6	21.8	24.1	100
1968	0.5	5.6	2.7	23.5	6.0	3.2	11.2	21.9	23.4	100
1969	0.4	7.4	1.9	24.2	7.4	2.6	10.8	23.9	21.5	100
1970	0.5	7.6	1.8	26.3	7.3	3.6	9.5	21.6	22.3	100
1971	0.5	7.6	1.7	26.0	6.7	3.1	8.8	21.8	23.6	100
1972	0.5	7.5	1.7	26.9	6.1	3.0	8.2	21.7	24.4	100

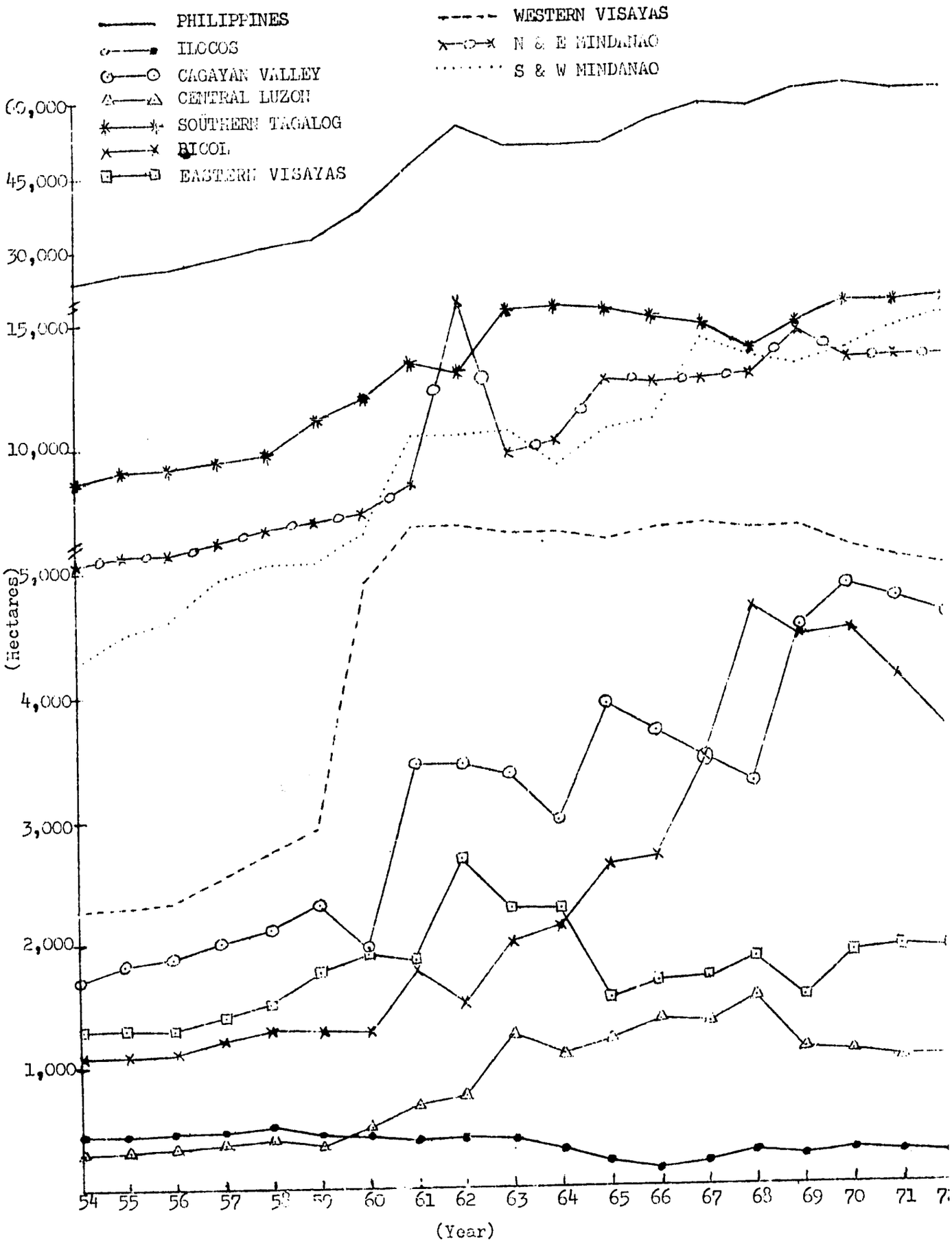

Fig. 7.4 Trends in cacao and coffee area by region, Philippines, 1954-1972

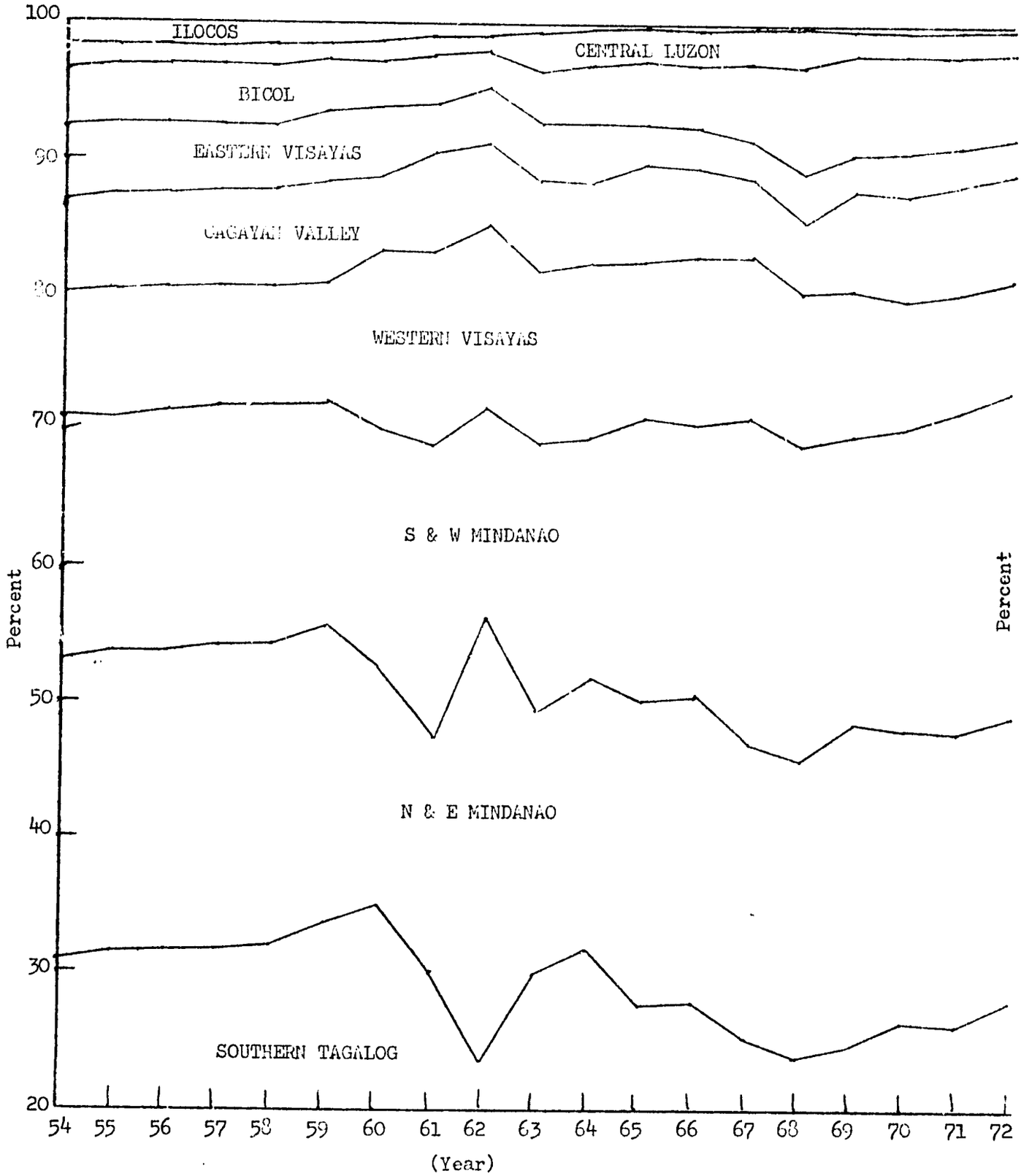

Fig. 7.5. Relative contribution of various regions to total cacao and coffee area, Philippines, 1954-1972

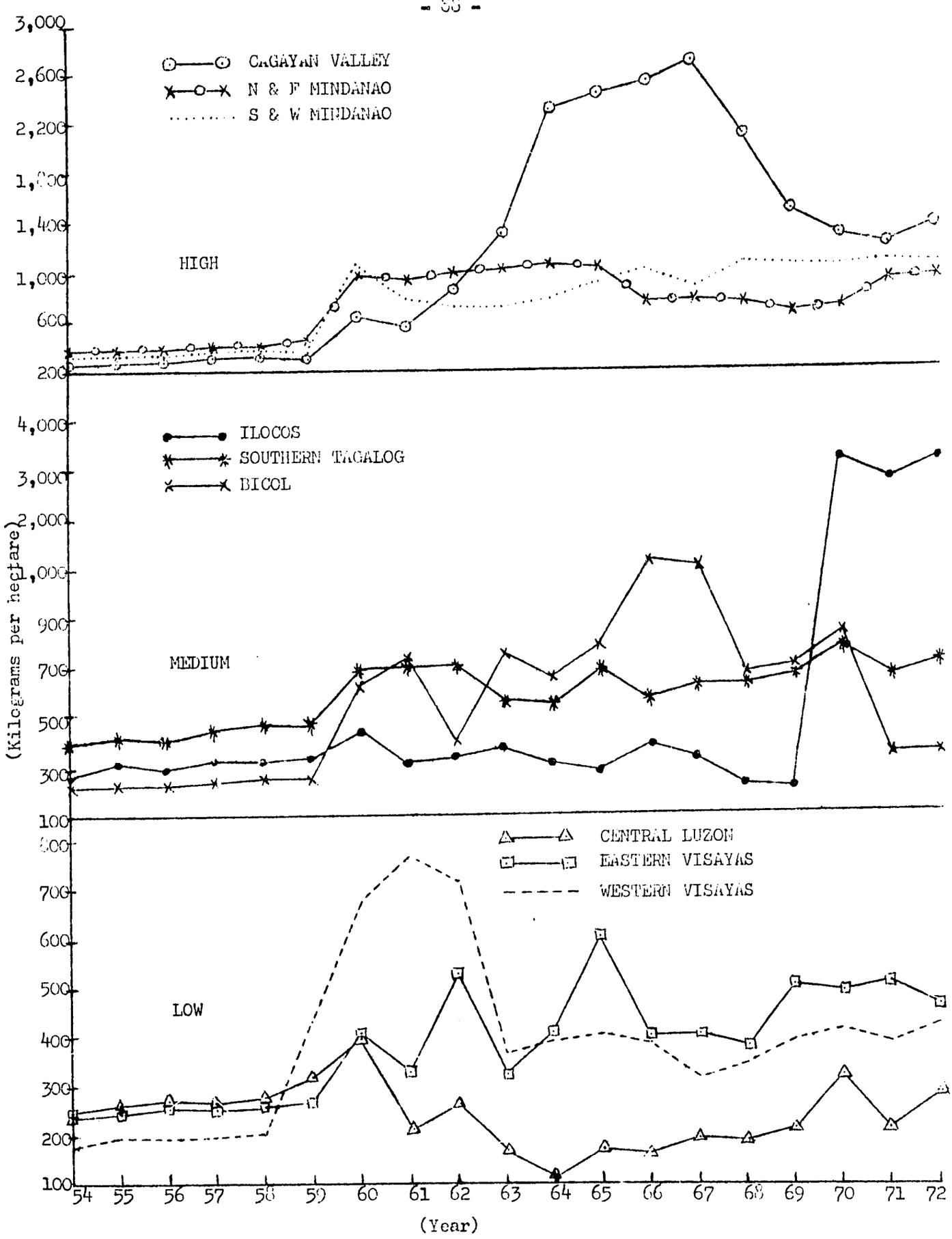

Fig. 7.6. Trends in cacao and coffee yields in various regions, Philippines, 1954-1972

Ilocos differed from the national hectarage trend. Cacao and coffee area in this region decreased in the 1960's but increased in the later years. The two Visayas regions exhibited decreasing trends in area from 1963 to 1972. On the other hand, Bicol and Cagayan Valley showed the greatest area increases from 1963 to 1968.

Southern Tagalog contributed most to total hectarage of cacao and coffee ranging from 23.5 to 33.8 percent. The two Mindanao regions also contributed 17 to 24 percent each to total cacao and coffee area. Ilocos and Central Luzon had the least contibutions.

Yield variations

Cacao and coffee productivity exhibited an increasing trend in all regions except Central Luzon, Ilocos, Cagayan Valley and Southern and Western Mindanao had the highest annual growth rates in yield of 13.9, 10.0, and 8.1 per cent, respectively (Fig. 7.6). Central Luzon had the lowest annual rate of 0.9 per cent. For the country as a whole, it obtained a growth rate of yield of 5.7 per cent per year.

Among the various regions of the country, Cagayan Valley and the two Mindanao regions were considered high yielding group. On the other hand, Eastern Visayas, Western Visayas and Central Luzon had the lowest yield. The other three regions fall under the medium yielding group.

Table 7.5. Effects of regional area shifts on the national yield of cacao and coffee, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	340.0	335.3	331.4	332.1
1959/63	693.6	697.2	697.4	704.7
1964/68	846.0	831.5	841.9	885.8
1969/72	843.6	824.4	823.6	850.7
	yield index (1954/58 = 100)			
1954/58	100.0	98.6	97.5	97.7
1959/63	204.0	205.1	205.1	207.3
1964/68	248.8	244.6	247.6	260.5
1969/72	248.1	242.5	242.2	250.2

Effects of Regional Area Shifts on National Yield

The regional area shifts in cacao and coffee hectarage had no apparent effect on national yield. Table 7.5 shows that if the 1954/58 regional yields had remained constant until 1969/72, the national yield would have slightly decreased from 340.0 to 332.1 kilograms per hectare. On the other hand, if the regional yields in previous periods had been the same as those in 1969/72, the national yield would have been a little lower in these periods than in 1969/72.

The actual national yield increased about three times between 1954/58 and 1969/72 from 340.0 to 850.7 kilograms per hectare. However, if the 1954/58 regional acreage distribution had remained constant the national yield would have increased to 843.6 kilograms only in 1969/72.

CHAPTER VIII

VEGETABLES

Vegetables are a major part of the Filipino diet constituting the cheapest sources of proteins, minerals and vitamins. Total consumption of vegetables in the Philippines for the years 1969 and 1972 was estimated at 2.5 and 2.8 million metric tons, respectively by the Food and Nutrition Research Center and the Bureau of Agricultural Economics. With the same production trends, this indicated a drop in our sufficiency ratio from 42 per cent in 1969 to 39 per cent in 1972.[11]

Intensive cultivation of limited area is made possible by planting vegetable crops because of their short maturity periods. Vegetable crops have also relatively higher gross returns per unit area than cereal and fruit crops. However, their labor and capital requirements are also higher than other types of crops.

National Changes in Vegetable Production, Area and Yield

Slight increases in area, production and yield of vegetables were observed from 1954 to 1958. An abrupt decrease in area was noted from 1959 to 1961 followed by a relatively stable trend from 1962 to 1971. On the other hand, production increased tremendously from 1961 to 1970. A smooth increasing trend in yield was observed throughout the period. The national trends in production and yield had annual

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[11] Vegetable Crops (National Program of Research). Laguna: Crops Research Division, PCAR. 1972.

Table 8.1. Growth rates and periodical changes in vegetables production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72
	per cent											
Philippines	2.7	8.6	44.6	57.0	-2.1	-42.5	5.8	-39.3	5.0	88.9	36.7	158.2
Ilocos	-3.5	24.6	192.2	264.2	0.9	-14.3	53.2	31.4	2.6	45.3	90.7	177.2
C. Valley	5.6	126.9	-64.1	-18.4	-2.1	-42.1	-39.7	-65.1	7.9	291.6	-40.4	133.5
C. Luzon	5.0	-18.4	131.3	88.7	-0.4	-34.2	12.7	-25.8	5.4	24.0	105.2	154.4
S. Tagalog	-1.5	-25.4	21.1	-9.6	-4.9	-48.7	1.0	-48.2	3.6	45.5	20.0	74.5
Bicol	5.6	168.7	57.7	324.1	-0.4	-18.6	13.5	-7.6	6.1	230.3	39.0	359.0
E. Visayas	-2.3	-67.4	48.3	-51.6	-4.2	-74.7	34.5	-69.9	2.0	28.9	10.3	42.1
W. Visayas	-0.5	12.2	11.0	24.5	-6.0	-50.7	-31.9	-66.5	5.9	127.8	63.0	271.3
NE Mindanao	-0.9	-6.7	1.8	-5.1	-3.1	-34.9	-27.2	-53.3	2.7	45.5	39.7	103.2
SW Mindanao	1.4	-17.1	56.8	29.9	-3.5	-60.1	6.1	-57.7	5.0	107.8	47.8	207.1

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

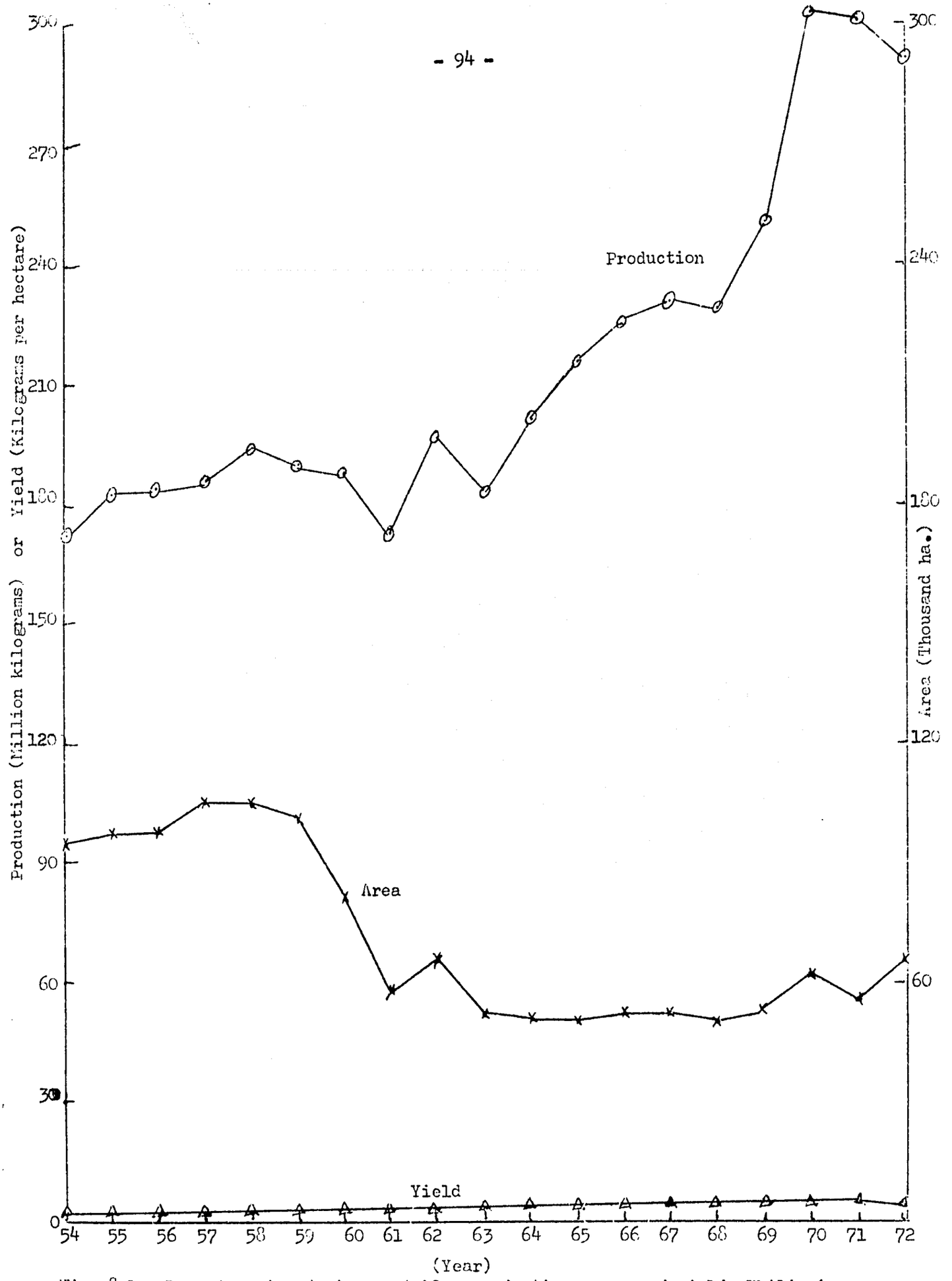

Fig. 8.1. Long-term trends in vegetables production, area and yield, Philippines,

Table 8.2. Relative influence of area and yield on vegetables production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
		per cent			
1954/57 to 1962/65					
Philippines	8.6	-675.3	775.3	nil	100
Ilocos	24.6	- 69.9	169.9	nil	100
C. Valley	106.9	- 66.6	166.6	nil	100
C. Luzon	-18.4	205.5	-105.5	nil	100
S. Tagalog	-25.4	26.9	-127.9	-1.0	100
Bicol	168.7	-20.8	120.8	nil	100
E. Visayas	-67.4	122.6	-22.6	nil	100
W. Visayas	12.6	-614.7	714.7	nil	100
NE Mindanao	- 6.7	641.1	-541.1	nil	100
SW Mindanao	8.6	489.3	-389.3	nil	100
1962/65 to 1969/72					
Philippines	44.6	15.2	84.8	nil	100
Ilocos	192.2	39.8	60.2	nil	100
C. Valley	-64.1	49.4	50.6	nil	100
C. Luzon	131.3	14.2	85.8	nil	100
S. Tagalog	21.1	5.0	95.0	nil	100
Bicol	57.7	27.8	72.2	nil	100
E. Visayas	48.3	75.2	24.8	nil	100
W. Visayas	11.0	-369.4	469.4	nil	100
NE Mindanao	1.8	-1871.9	1971.9	nil	100
SW Mindanao	56.8	13.1	86.9	nil	100
1954/57 to 1969/72					
Philippines	57.0	-110.4	210.4	nil	100
Ilocos	264.2	21.1	78.9	nil	100
C. Valley	-18.4	516.1	-416.1	nil	100
C. Luzon	88.7	-47.1	147.1	nil	100
S. Tagalog	- 9.6	649.3	549.1	-.2	100
Bicol	324.1	-5.4	105.4	nil	100
E. Visayas	-51.6	148.4	-48.4	nil	100
W. Visayas	-24.5	-498.2	- 598.2	nil	100
NE Mindanao	- 5.1	1454.8	-1354.8	nil	100
SW Mindanao	29.9	-328.4	428.4	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

rates of increase of 2.7 and 5.0 per cent, respectively while area decreased at the rate of -2.1 per cent annually (Figure 8.1 and Table 8.1).

For the period 1954/57 to 1969/72, the increase in production of 57.0 per cent was brought about by the yield increase of 158.2 per cent (Table 8.1). During the same period, an area reduction of 39.3 per cent was noted.

Regional Changes in Vegetables Production, Area and Yield

Regional variations in production

A marked increase in the national production of vegetables was noted for the three periods considered brought about by the favorable increase in yield.

For the period 1962/65 to 1969/72, all regions except Cagayan Valley experienced increases in production. The decline in production in Cagayan Valley was attributed to the downward movement in both area and yield. However, Table 8.2 shows that yield had a greater effect on the production change than area. In contrast, area had a greater influence than yield on the increase in production in Eastern Visayas during the same period.

Generally, changes in yield rather than area were responsible for production changes in most region during the three periods.

Annual variations in production

Positive growth rates in the production of vegetables were exhibited by only four out of nine regions namely: Cagayan Valley,

Table 8.3. Relative contribution of various regions to total vegetables production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	9.1	12.0	22.9	15.5	3.6	8.2	12.5	6.3	9.9	100
1955	9.7	11.5	27.2	15.1	3.4	7.6	11.7	5.0	8.8	100
1956	9.5	11.5	27.0	15.2	3.4	7.5	11.5	5.0	9.4	100
1957	9.5	11.6	26.4	15.2	3.4	7.5	11.5	5.0	9.9	100
1958	9.8	12.7	25.3	15.3	3.5	7.7	11.5	5.2	9.0	100
1959	9.7	15.3	24.1	15.3	3.9	7.8	11.7	5.3	6.9	100
1960	10.2	20.2	23.8	12.9	5.1	5.0	11.7	5.9	5.2	100
1961	10.9	22.5	28.2	8.2	6.9	3.9	8.6	5.9	4.9	100
1962	11.2	21.6	26.5	9.1	5.9	3.1	10.5	6.7	5.4	100
1963	11.0	26.3	18.8	9.1	8.7	2.6	12.9	4.1	6.5	100
1964	10.0	28.5	15.0	11.0	8.8	2.2	13.3	4.0	7.2	100
1965	11.2	21.3	17.8	12.0	10.4	1.4	12.3	3.7	9.9	100
1966	10.9	20.9	21.0	12.1	10.2	1.9	11.8	2.8	8.4	100
1967	10.9	20.1	20.3	13.1	10.8	1.9	11.2	2.5	9.2	100
1968	9.5	17.2	20.8	14.2	12.5	2.2	12.3	2.6	8.7	100
1969	9.0	19.1	21.8	10.9	13.2	2.3	12.2	3.0	8.5	100
1970	8.2	16.0	32.3	9.1	11.5	1.9	9.9	3.4	7.7	100
1971	9.8	18.9	34.2	8.4	6.9	2.1	9.0	3.0	7.7	100
1972	10.6	20.4	34.7	7.0	6.1	3.2	6.8	3.5	7.7	100

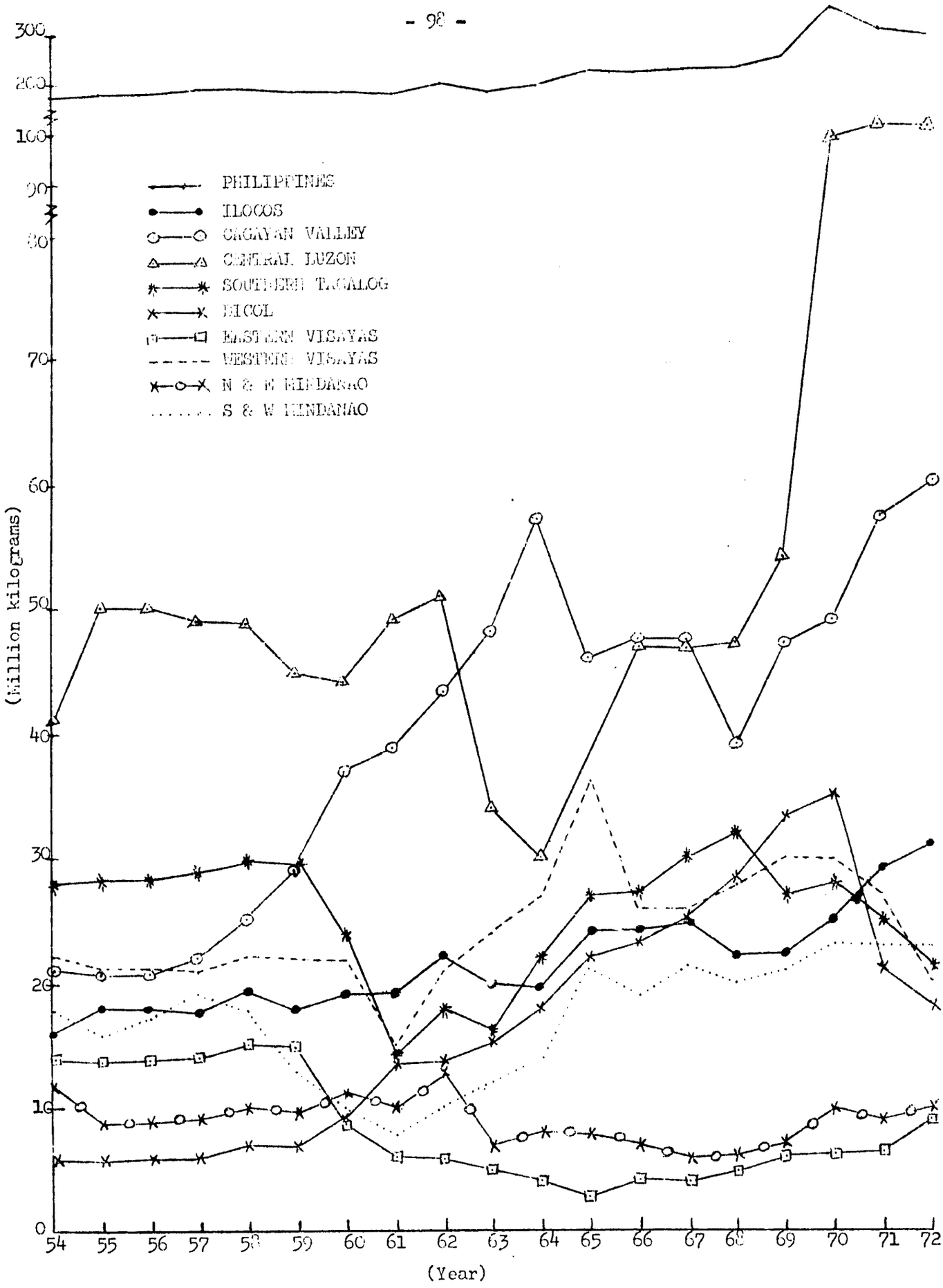

Fig. 9.2 Trends in vegetables production by region, Philippines, 1954-1972

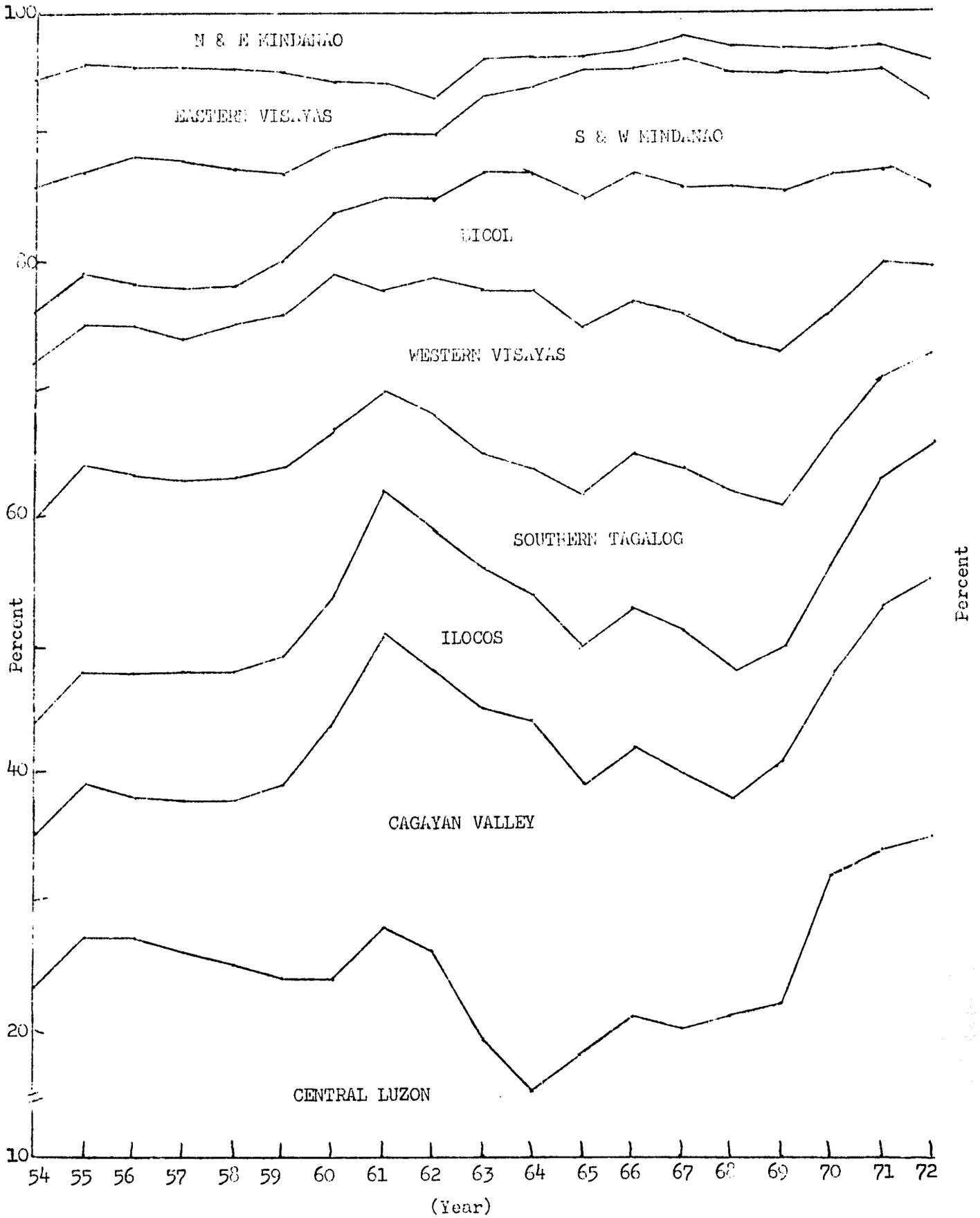

Fig. 3.3. Relative contribution of various regions to total vegetables production, Philippines, 1954-1972

Central Luzon, Bicol and Southern and Western Mindanao (Fig. 8.2). Central Luzon, the top vegetable producing region with its 102.5 million kilos of vegetables in 1972, increased its production at an annual rate of 5.0 per cent. Ilocos, on the other hand, had a negative growth rate of -3.5 per cent per year. Cagayan Valley and Bicol topped all regions with annual production growth rates of 5.6 per cent. Production in the Bicol region expanded rapidly from 1954 to 1970 but it declined abruptly during the last two years.

The regions which showed negative growth rates in production were Ilocos (-3.5), Eastern Visayas (-2.3), Southern Tagalog (-1.5), Western Visayas (-0.5) and Northeastern Mindanao (-0.5). Western Visayas experienced a relatively stable production in 1954 to 1960, dropped in production in 1961 but immediately recovered until it reached its peak in 1965.

Except for the years 1963 to 1965, Central Luzon had the biggest relative contribution to total vegetable output (Table 8.3). Central Luzon's contribution in 1954 was 22.9 per cent; this decreased in 1964 to its lowest point of 15.0 per cent then recovered during the succeeding years especially during the last three years when the region accounted for over 30 per cent of the total vegetable production.

Cagayan Valley was the top vegetable producer contributing 26.3, 28.5; and 21.3 per cent of the total output in 1963, 1964 and 1965, respectively, as against Central Luzon's 16.8, 15.0 and 17.8 per cent during the same years.

Table 8.4. Relative contribution of various regions to total vegetables area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	11.3	11.9	21.0	14.4	3.8	9.2	12.3	5.7	9.3	100
1955	12.0	11.8	23.6	14.2	3.5	9.2	11.6	4.9	9.2	100
1956	11.9	12.1	23.0	14.4	3.6	9.2	11.6	4.9	9.3	100
1957	12.0	12.0	22.9	14.4	3.5	9.2	11.7	4.9	9.4	100
1958	11.7	12.5	21.9	14.5	3.7	9.5	11.8	5.2	9.2	100
1959	11.9	13.3	20.8	15.0	3.9	9.9	11.6	5.6	8.6	100
1960	12.5	12.5	25.2	12.8	4.4	8.2	11.2	7.6	6.2	100
1961	13.6	10.7	35.9	6.5	5.7	5.8	1.1	7.8	4.7	100
1962	15.8	10.8	31.3	10.1	4.7	3.7	10.9	8.1	4.6	100
1963	17.3	12.3	25.7	12.4	6.8	3.9	10.6	5.2	5.8	100
1964	17.8	13.4	23.9	14.1	4.7	4.5	9.8	5.0	6.9	100
1965	19.9	11.9	22.2	15.2	4.6	4.4	9.3	3.9	8.6	100
1966	19.8	11.5	23.7	15.1	4.8	4.8	9.1	3.2	8.0	100
1967	20.6	11.2	22.5	15.9	5.0	4.8	8.9	3.1	8.0	100
1968	19.6	11.5	20.6	17.9	5.5	4.6	9.4	2.9	7.0	100
1969	19.1	13.2	20.5	17.4	6.1	5.2	8.6	3.2	6.7	100
1970	19.0	11.2	27.0	15.4	6.0	4.1	7.7	3.8	5.8	100
1971	22.1	13.0	33.2	7.9	4.5	5.0	4.2	3.8	6.3	100
1972	20.2	11.8	30.1	8.4	5.3	6.6	5.7	4.8	7.1	100

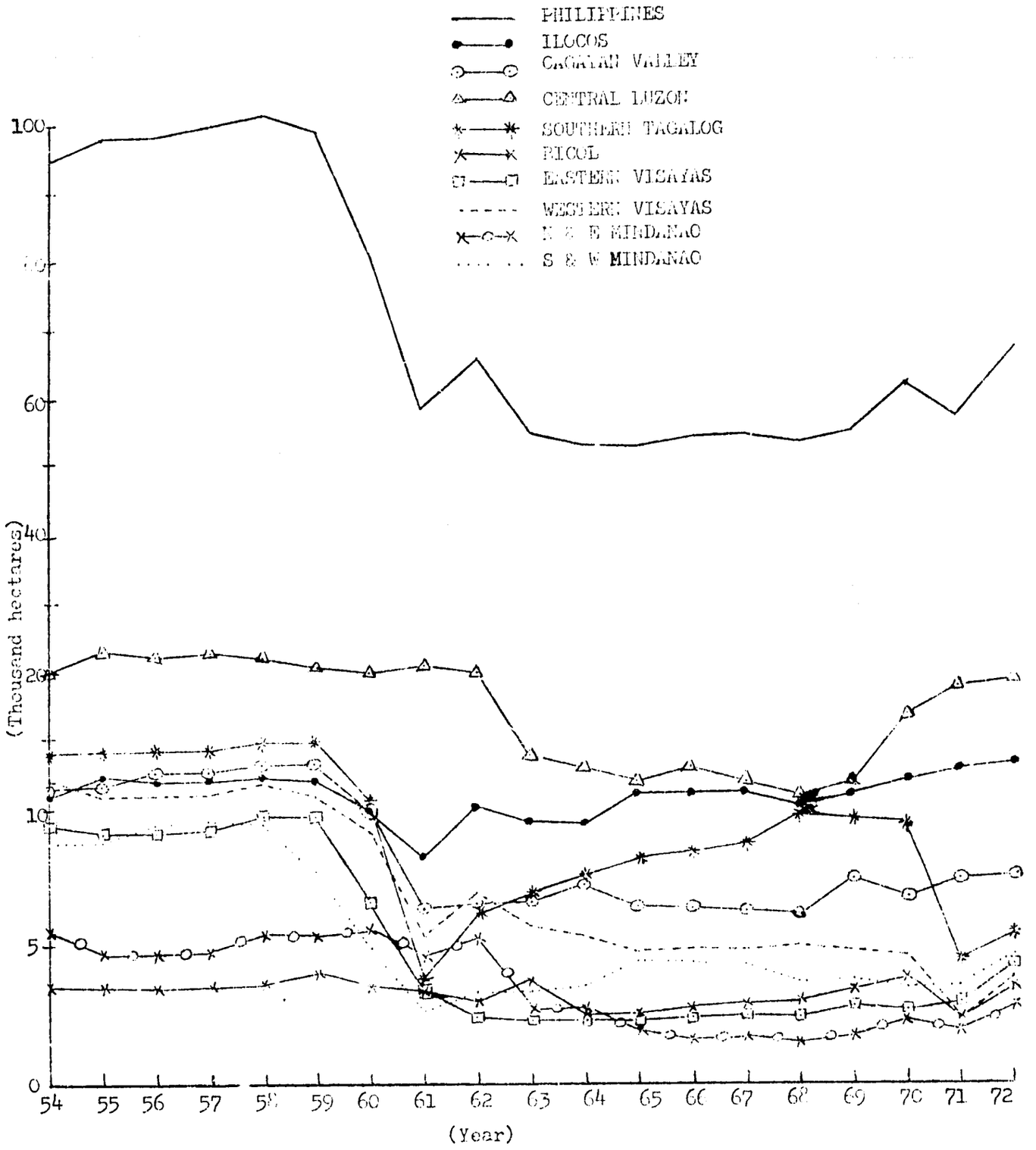

Fig. 8.4. Trends in vegetables area by region, Philippines, 1954-1972

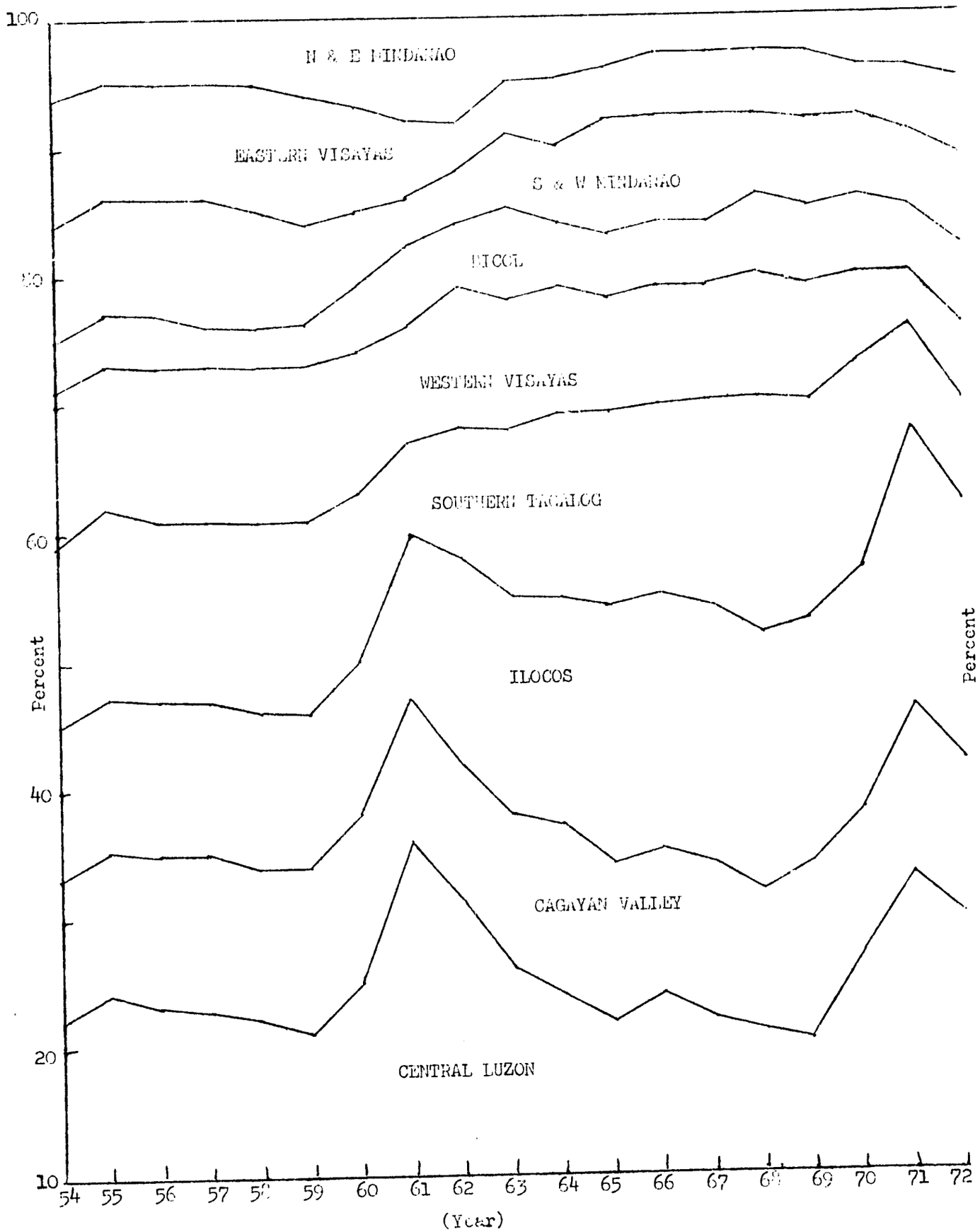

Fig. 8.5. Relative contribution of various regions to total vegetables area, Philippines, 1954-1972

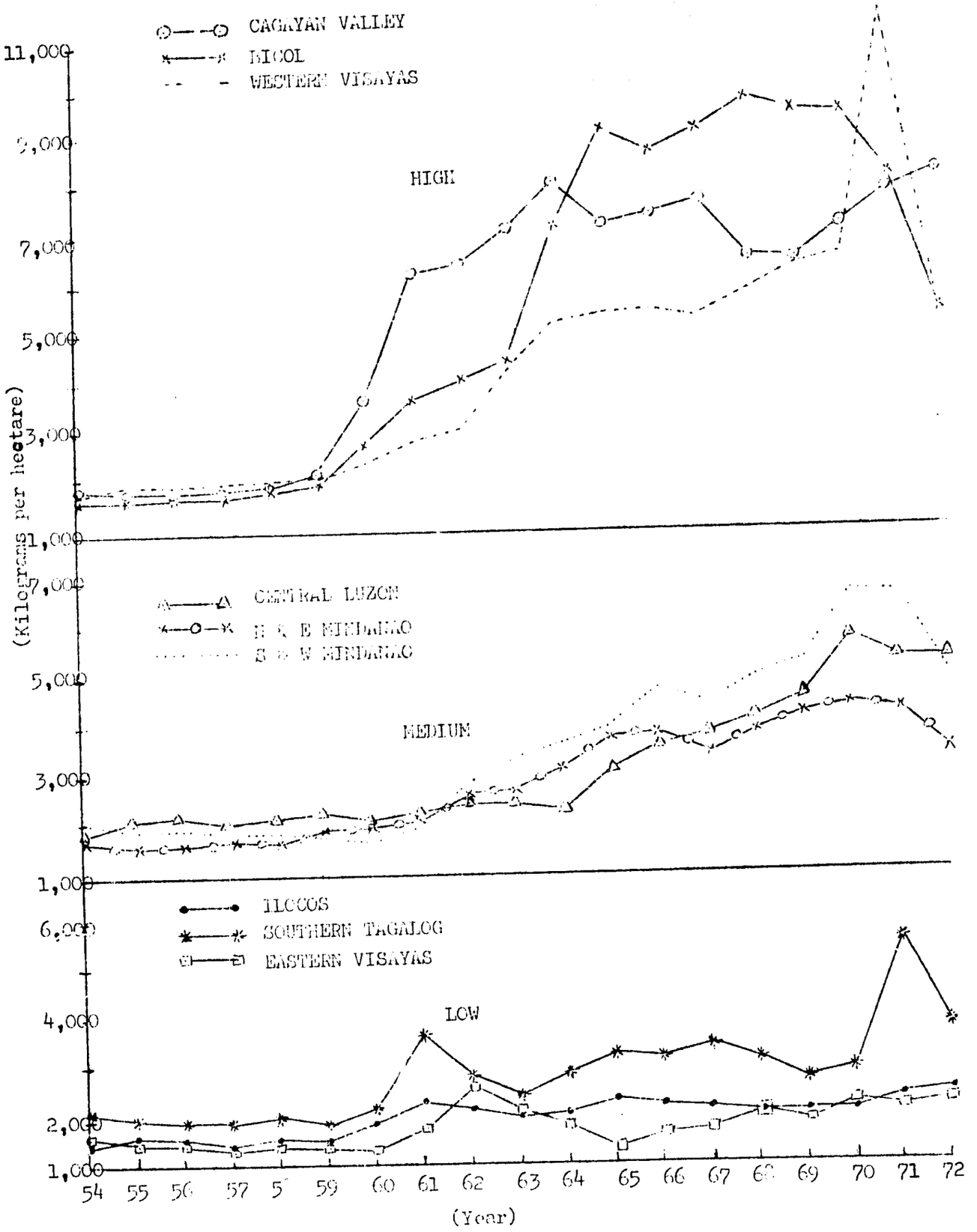

Fig. 3.6. Trends in vegetables yields in various regions, Philippines, 1954-1972

Eastern Visayas and Northern and Eastern Mindanao had declining production trends while the rest of the regions exhibited upward trends.

Area Variations

The national hectarage trend decreased evidently at the rate of -2.1 per cent annually. It was characterized by a moderately increasing pattern during the first five years followed by a irregularly decreasing line in the ensuing years. Ilocos region departed from the general decreasing trend with an annual growth rate of .9 per cent.

All regions had slight increases in hectarage from 1955 to 1959 but had abrupt declines in 1961 except Central Luzon and Bicol. The top four vegetable-producing regions were Central Luzon, Ilocos, Southern Tagalog and Cagayan Valley.

Central Luzon, the number one vegetable producing region, had a relative contribution of 21.6 per cent in 1954 and the highest with 35.9 per cent of the vegetable area in 1961. The relative contribution of Ilocos, which was second to Central Luzon, remained relatively stable from 1954 to 1968 and increased markedly during the succeeding years. The region's contribution ranged from 11.3 per cent in 1954 and 22.1 per cent in 1971. Southern Tagalog also showed a great share in the total vegetable area ranging from 6.5 per cent in 1961 to 18.9 per cent in 1968.

Yield Variations

Among the nine regions, Western Visayas, Bicol, and Cagayan Valley were classified as vegetable high yielding retions with productivity trends showing relative stability from 1954 to 1959, abrupt increases from 1960 to 1965, and fluctuations with generally upward movement up to 1972. During the last two years yield continued to rise in Cagayan Valley but suddenly dropped in Bicol (Fig. 8.6).

For the medium yielding regions, yields were also stable during the first six years followed by increasing trends until 1972 when yields started to decline. Regions under this category are Central Luzon, Southern and Western Mindanao and Northern and Eastern Mindanao.

The low yielding regions, namely: Southern Tagalog, Ilocos, and Eastern Visayas also had the least increases in productivity during the 19-year period under review.

Effects of Regional Area Shifts on National Yield

Changes in acreage distribution among regions had a negative effect on the national yield of vegetables (Table 8.5). Between 1954/58 and 1969/72, if the regional yields had remained constant the national yield would have declined from 6,876 to 1,000 kilograms per hectare. On the other hand, the national yields in 1954/58, 1959/63 and 1964/68 would have been greater if the regional yields during these periods had been the same as that of the 1969/72 actual yield.

Table 8.5. Effects of regional area shifts on the national yield of vegetables, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	1,876.2	1,874.0	1,864.0	1,868.8
1959/63	2,596.3	2,592.1	2,596.9	2,599.2
1964/68	4,108.2	4,142.5	4,086.8	4,055.4
1969/72	4,940.0	4,967.7	4,828.7	4,832.9
	yield index (1954/58 = 100)			
1954/58	100.0	100.5	99.4	99.6
1959/63	138.1	138.5	139.4	139.0
1964/68	219.0	220.8	217.8	216.2
1969/72	263.3	265.8	257.4	257.6

The actual yield per hectare had increased from 1,876 in 1954/58 to 4,833 kilograms in 1969/72. However, the 1969/72 national yield would have been higher (4,940 kgm/ha.) if the 1954/58 acreage distribution among regions had remained constant.

CHAPTER IX

BEANS AND PEAS

Beans and peas are promising secondary crops that can be grown profitably after rice and corn as intercrops. Of the total area devoted to beans and peas in 1972, about [illegible] per cent was devoted to mongo, 12 per cent to dry beans and the rest, to soybeans. Mango and soybean are used in the manufacture of especialty foods. Moreover, soybean which has a high quality protein is used as one of the major protein supplements for livestock and poultry feeds.

The domestic demand for mongo is great and the export market for this crop is encouraging. On the other hand, the Philippines has been importing ₱70 million worth of soybean meal yearly because the country's soybean production is lagging behind local requirements.[12/]

National Changes in Beans and Peas Production, Area and Yield

Trends in beans and peas production, area and yield showed a gradual increase from 1954 to 1959 (Fig. 9.1). From 1960, production and area decreased continously up to 1972. Likewise, yield per hectare decreased from 1960 up to 1967 after which it increased tremendously until 1972.

12/ Soybean and other field legumes (National Program of Research). Laguna. Crops Research Division, PCAR, 1972.

Table 9.1. Growth rates and periodical changes in beans and peas production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72
	per cent											
Philippines	-2.6	-29.0	-23.2	-45.3	-2.0	-9.4	-25.3	-32.3	-0.5	-21.5	2.7	-19.2
Ilocos	-4.9	-35.4	-44.3	-64.0	-4.7	-30.3	-46.9	-63.0	-0.2	-7.2	5.0	-2.6
C. Valley	-4.0	-51.0	-6.5	-54.3	-2.5	-22.8	-21.4	-39.2	-1.5	-36.7	18.9	-24.7
C. Luzon	1.6	42.0	-13.2	23.4	0.8	37.2	-17.9	12.6	0.8	3.6	5.7	9.6
S. Tagalog	-3.3	-59.6	-19.1	-67.3	-4.3	-49.3	-27.3	-63.1	1.1	-20.3	11.2	-11.3
Bicol	-8.3	-17.0	-46.4	-55.4	-6.2	-26.0	-44.3	-58.8	-2.2	12.4	-3.8	8.2
E. Visayas	-4.4	-70.2	15.1	-65.8	-5.1	-58.1	-12.1	-63.2	0.8	-29.0	31.0	-7.0
W. Visayas	-4.3	-20.0	-42.6	-54.0	-1.7	-17.4	-29.9	-17.8	-2.6	-31.7	-18.1	-44.1
NE Mindanao	-7.9	-28.2	-66.4	-75.9	-6.2	-39.4	-56.9	-73.9	-1.7	18.6	-21.9	-7.5
SW Mindanao	-0.4	-46.7	30.0	-30.7	-0.6	-39.7	16.8	-29.6	0.2	-11.5	11.3	-1.5

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[1t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

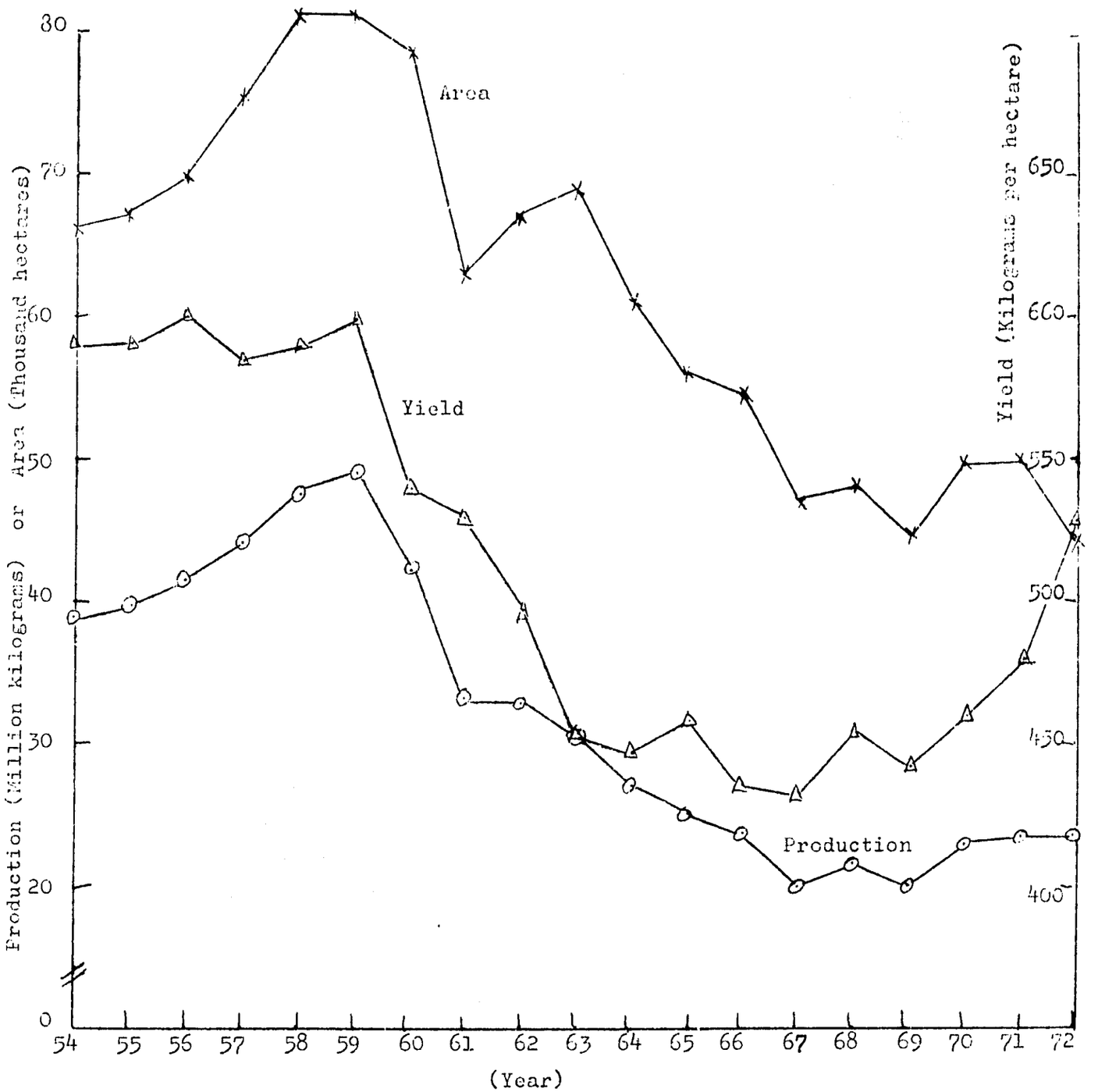

Fig. 9.1. Long-term trends in beans and peas production, area and yield, Philippines, 1954-1972

Table 9.2. Relative influence of area and yield on beans and peas production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
		per cent			
1954/57 to 1962/65					
Philippines	-29.0	28.9	71.1	nil	100
Ilocos	-35.0	82.8	17.2	nil	100
C. Valley	-51.0	36.1	63.9	nil	100
C. Luzon	42.0	89.9	10.1	nil	100
S. Tagalog	-60.0	75.0	25.0	nil	100
Bicol	-17.0	163.6	-63.6	nil	100
E. Visayas	-70.0	71.8	28.2	nil	100
W. Visayas	-20.0	-72.3	172.3	nil	100
NE Mindanao	-29.0	151.3	-51.3	nil	100
SW Mindanao	-47.0	80.5	19.5	nil	100
1962/65 to 1969/72					
Philippines	-23.2	110.7	-10.7	nil	100
Ilocos	-44.3	108.3	- 8.3	nil	100
C. Valley	- 6.5	358.8	259.0	-.2	100
C. Luzon	-13.2	139.3	-39.3	nil	100
S. Tagalog	-19.1	150.3	-50.3	nil	100
Bicol	-46.4	93.7	6.3	nil	100
E. Visayas	15.1	-92.0	192.0	nil	100
W. Visayas	-42.6	64.1	35.9	nil	100
NE Mindanao	-66.4	77.2	22.8	nil	100
SW Mindanao	30.0	59.0	41.0	nil	100
1954/57 to 1969/72					
Philippines	-45.3	64.6	35.4	nil	100
Ilocos	-70.0	97.4	2.6	nil	100
C. Valley	-54.3	63.6	36.4	nil	100
C. Luzon	23.4	56.5	43.5	nil	100
S. Tagalog	67.3	89.3	10.7	nil	100
Bicol	-55.4	109.9	-9.9	nil	100
E. Visayas	-65.8	93.3	6.7	nil	100
W. Visayas	-54.6	25.2	74.8	nil	100
NE Mindanao	-75.8	94.5	5.5	nil	100
SW Mindanao	-30.7	95.8	4.2	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

The annual rates of growth in production, area and yield were -2.6, -2.0 and -0.5 per cent, respectively (Table 9.1). Decreases in both area (-32.0 per cent) and yield (-17.2 per cent) for the period 1954/57 to 1969/72 resulted in a negative change of 45.31 per cent in beans and peas production. During the period 1962/65 to 1969/72, production and area decreased by -23.2 and -25.3 per cent, respectively but yield increased by 37.5 per cent.

Regional Changes in Beans and Peas Production, Area and Yield

Regional variations in production

All of the regions except Central Luzon showed negative growth rates. Also, considering all regions, only Central Luzon had a positive change in production from 1954/57 to 1962/65. In contrast, only Eastern Visayas and Southern and Western Mindanao had production increases between 1962/65 and 1969/72.

Table 9.2 shows that area had a greater effect on changes in production than yield in all regions except Philippines, Cagayan Valley and Western Visayas from 1954/57 to 1962/65. The same holds true during the second period 1962/65 to 1969/72 except Cagayan Valley and Eastern Visayas.

From 1954 to 1959, all regions depicted slight upward movement in production with Western Visayas leading them all. After 1959, Central Luzon was the only region with improved production while the rest suffered decreases, thus, drawing the national production to a downward trend (Fig. 9.2 and Table 9.1).

Table 9.3. Relative contribution of various regions to total beans and peas production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	7.7	15.8	13.4	11.0	1.7	7.1	28.2	4.5	10.6	100
1955	7.7	15.8	13.4	11.0	1.7	7.1	28.2	4.5	10.6	100
1956	7.7	15.8	13.4	11.0	1.7	7.1	28.2	4.5	10.6	100
1957	7.8	15.8	13.3	11.0	1.7	7.1	28.0	4.5	10.8	100
1958	7.6	15.8	13.4	11.1	1.7	7.1	28.1	4.5	10.7	100
1959	8.2	14.2	12.0	10.4	1.7	7.2	32.2	4.4	9.7	100
1960	7.4	18.1	17.3	8.1	1.7	6.1	34.5	4.9	7.9	100
1961	8.0	11.8	20.2	7.4	1.8	4.5	33.9	5.6	6.9	100
1962	6.5	[illegible].3	21.8	6.9	1.8	3.6	38.2	6.3	5.6	100
1963	6.6	5.9	33.5	5.9	1.9	2.5	27.9	3.9	7.9	100
1964	7.9	11.7	22.9	6.0	2.2	2.7	33.4	4.3	8.9	100
1965	7.2	15.2	28.7	6.1	2.3	3.1	25.8	3.8	9.8	100
1966	6.6	13.9	26.8	6.5	2.3	4.9	24.9	3.6	10.6	100
1967	6.6	16.6	28.7	7.6	2.8	3.7	17.4	4.2	12.4	100
1968	5.5	15.5	32.3	5.2	2.6	3.2	20.6	2.6	10.1	100
1969	4.9	15.5	34.8	4.5	2.3	3.4	26.2	2.6	11.8	100
1970	5.3	13.1	25.4	6.3	1.8	5.0	29.1	2.0	12.0	100
1971	5.1	12.6	30.9	5.6	1.0	4.1	24.8	2.3	13.6	100
1972	4.8	11.9	29.9	9.5	0.5	5.0	20.2	1.8	16.4	100

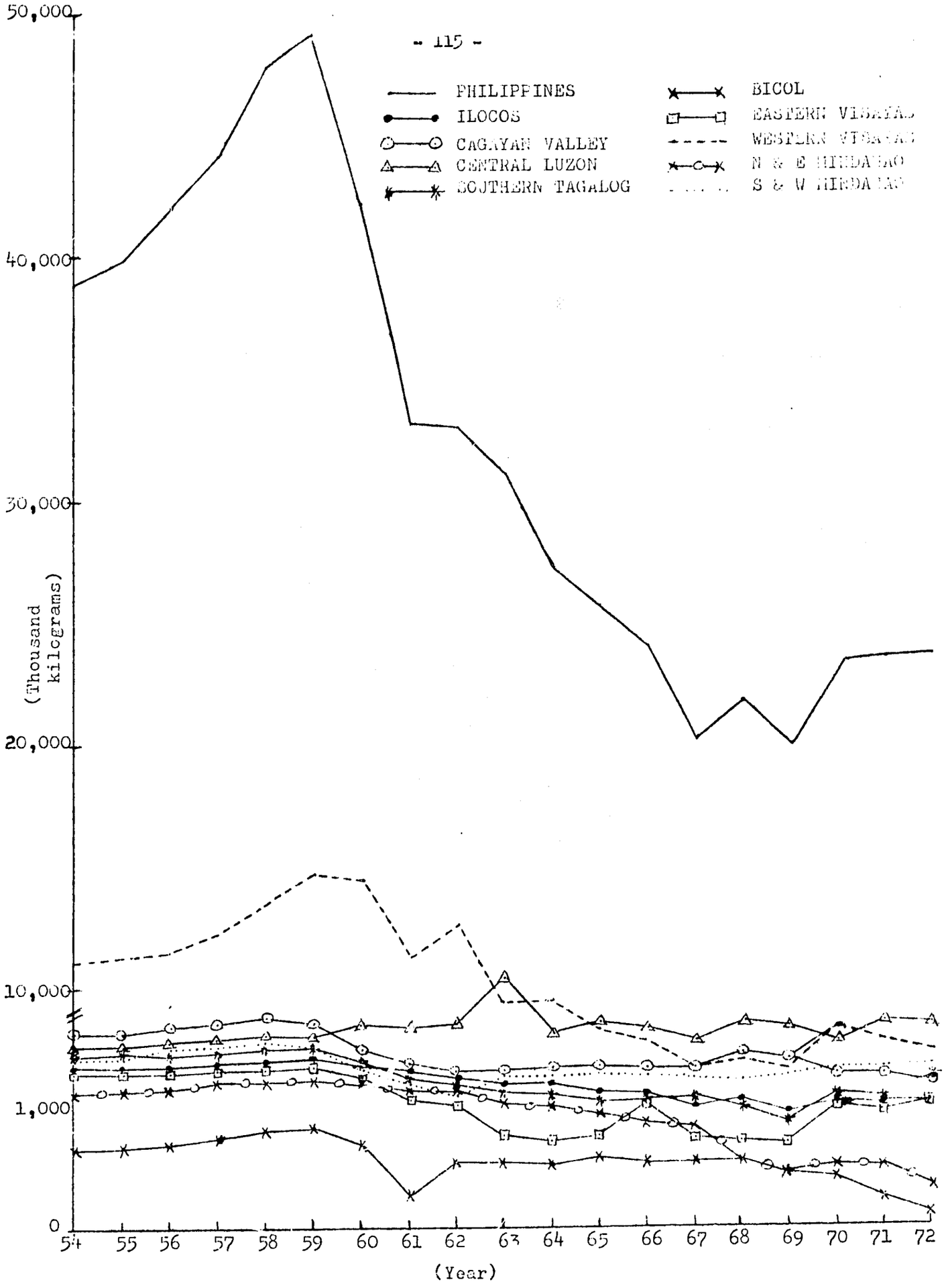

Fig. 9.2. Trends in beans and peas production by region, Philippines,

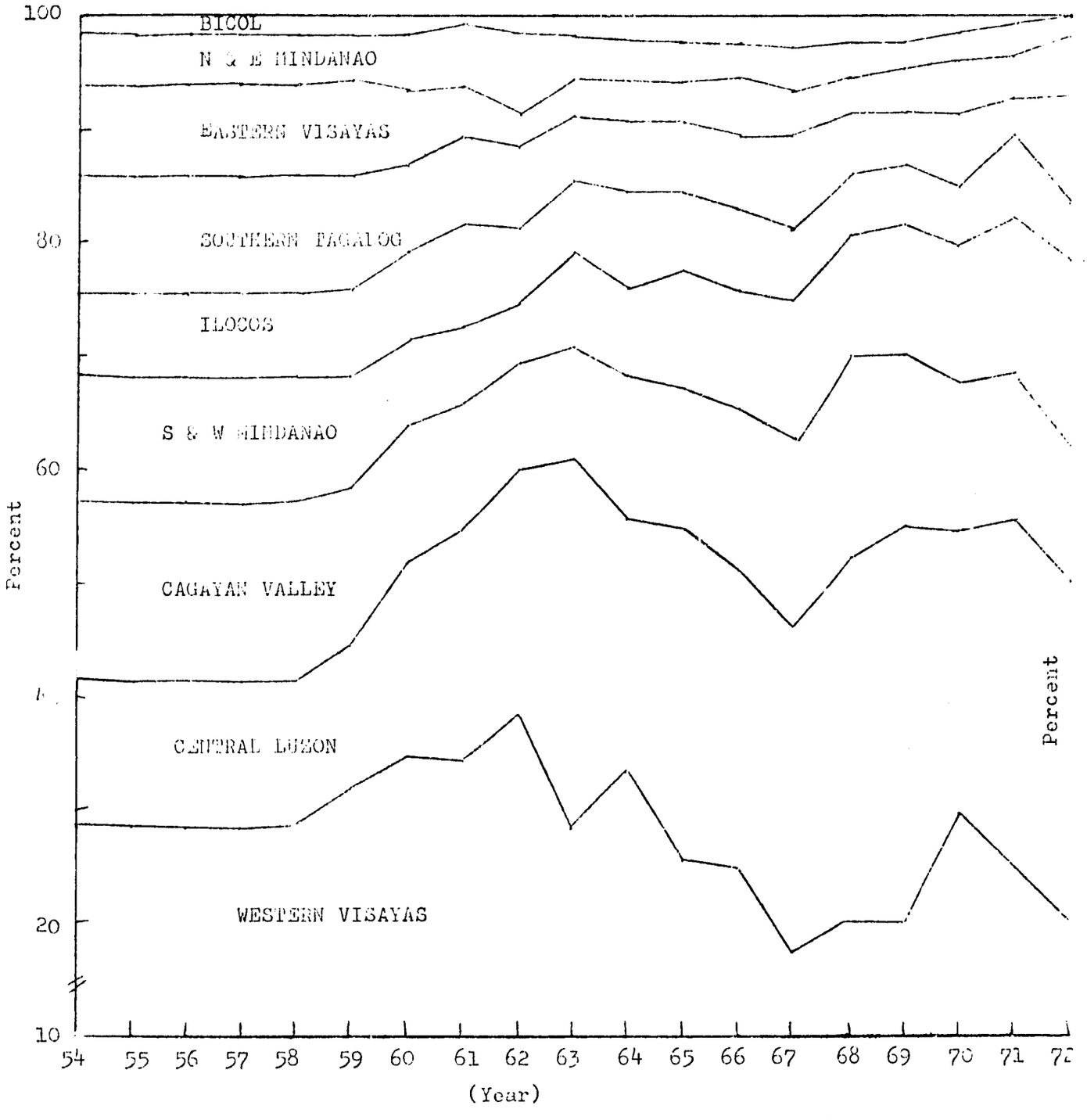

Fig. 9.3. Relative contribution of various regions to total beans and peas production, Philippines, 1954-1972

Until 1962, Western Visayas contributed most to the total Philippine production of beans and peas. Its share to total output noticeably increased from 2[illegible].2 per cent in 1954 to 3[illegible].2 per cent in 1962. However, the region's relative contribution declined to only 33.4 per cent in 1964 and further decreased to 20.2 per cent in 1972.

The decline in the relative importance of Western Visayas covering the period 1963 to 1972 (except 1964 and 1970) resulted in the rise of the relative importance of Central Luzon as the top beans and peas producing region. Its highest contribution of 34.8 per cent was noted in 1969 as against Western Visayas' 20.2 per cent during the same year.

Among the nine regions, Bicol had the least relative contribution ranging from 0.5 per cent to 2.8 per cent during the entire period.

Area variations

The total area planted to beans and peas decreased at the rate of -2.0 per cent per year. All regions, except Central Luzon, followed similar pattern as that of the national trend. After a steady increase in area from 1954 to 1961, Central Luzon managed to show a stable hectarage during the last 9 years which resulted in its slight annual rate of growth of 0.[illegible] per cent. Bicol and Northern and Eastern Mindanao decreased in hectarage rapidly at the rate of -6.2 per cent per year.

Table 3.4. Relative contribution of various regions to total beans and peas area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	8.1	11.6	14.9	11.8	1.8	7.7	32.6	4.0	7.5	100
1955	8.1	11.6	14.9	11.8	1.8	7.7	32.6	4.0	7.5	100
1956	8.1	11.6	14.9	11.8	1.8	7.7	32.6	4.0	7.5	100
1957	8.6	11.8	14.6	12.0	1.9	7.6	31.9	4.2	7.4	100
1958	8.7	11.8	14.6	12.1	1.9	7.6	31.7	4.2	7.4	100
1959	8.6	12.1	14.4	11.0	2.0	7.6	32.8	4.3	7.2	100
1960	7.2	10.8	17.4	8.3	2.1	6.3	38.4	3.8	5.7	100
1961	6.7	9.8	22.6	6.8	0.8	5.5	39.0	4.1	4.7	100
1962	6.1	9.6	29.0	7.0	1.4	5.0	44.3	3.7	3.[illegible]	100
1963	5.7	8.4	27.0	6.5	1.4	3.2	41.0	2.1	4.7	100
1964	7.3	11.0	1[illegible].3	6.5	1.5	2.0	44.8	2.3	5.3	100
1965	6.3	12.2	23.2	6.5	1.8	4.0	37.3	2.6	6.1	100
1966	6.0	10.5	2[illegible]	6.6	1.7	5.7	3[illegible].8	2.5	6.3	100
1967	5.7	13.4	23.2	7.5	2.0	4.6	33.1	2.[illegible]	7.6	100
1968	4.9	11.8	23.7	6.3	1.9	4.7	3[illegible].4	1.7	6.6	100
1969	4.2	11.1	25.0	6.1	1.6	5.0	38.5	1.4	7.1	100
1970	4.4	10.3	22.3	6.2	1.3	4.1	43.1	1.5	6.8	100
1971	4.5	10.0	25.6	6.0	0.8	3.5	40.4	1.6	7.6	100
1972	4.9	10.6	25.7	7.5	0.8	4.2	34.8	1.7	9.3	100

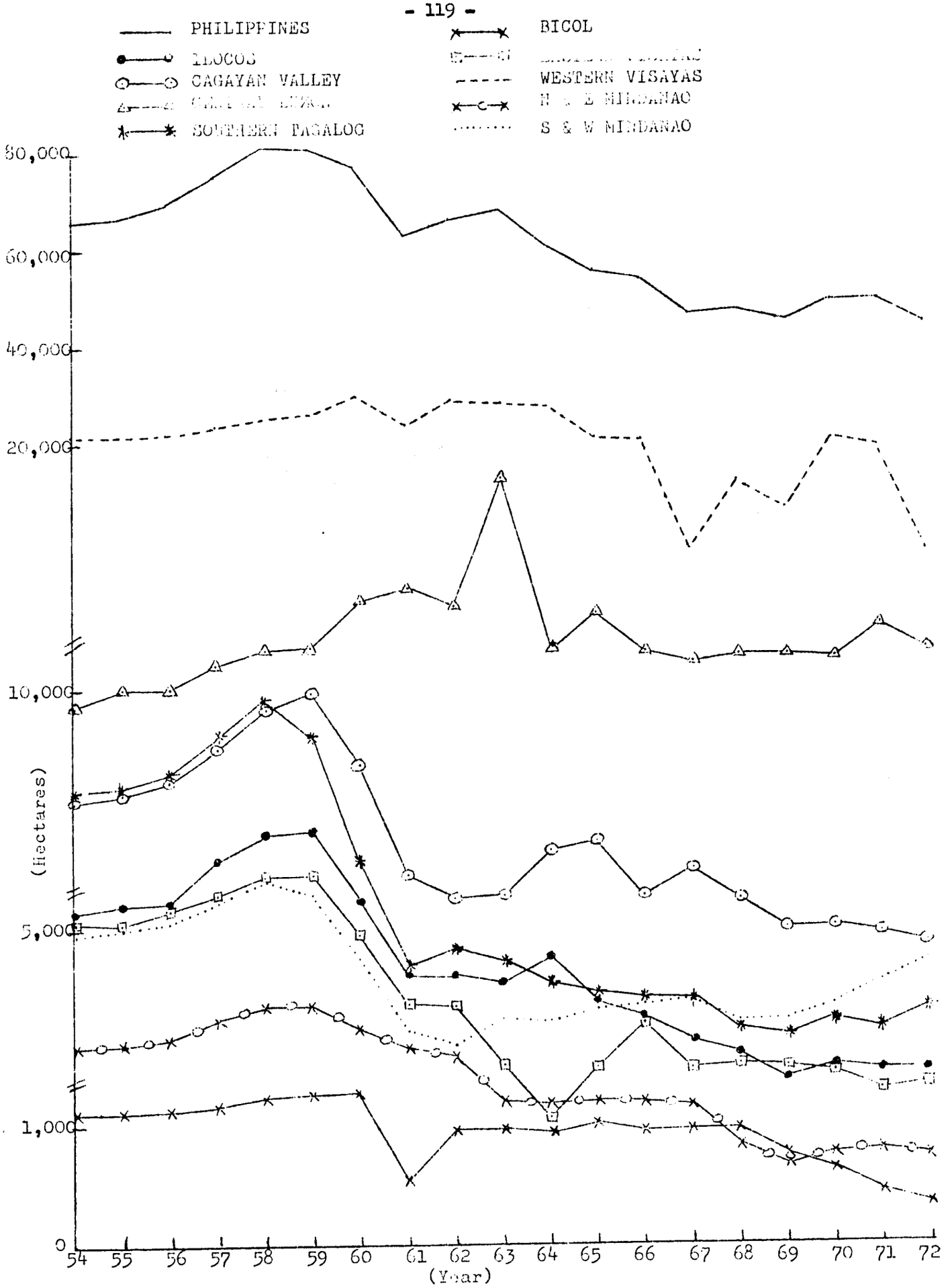

Fig. 9.4. Trends in beans and peas area by region, Philippines, 1954-1972

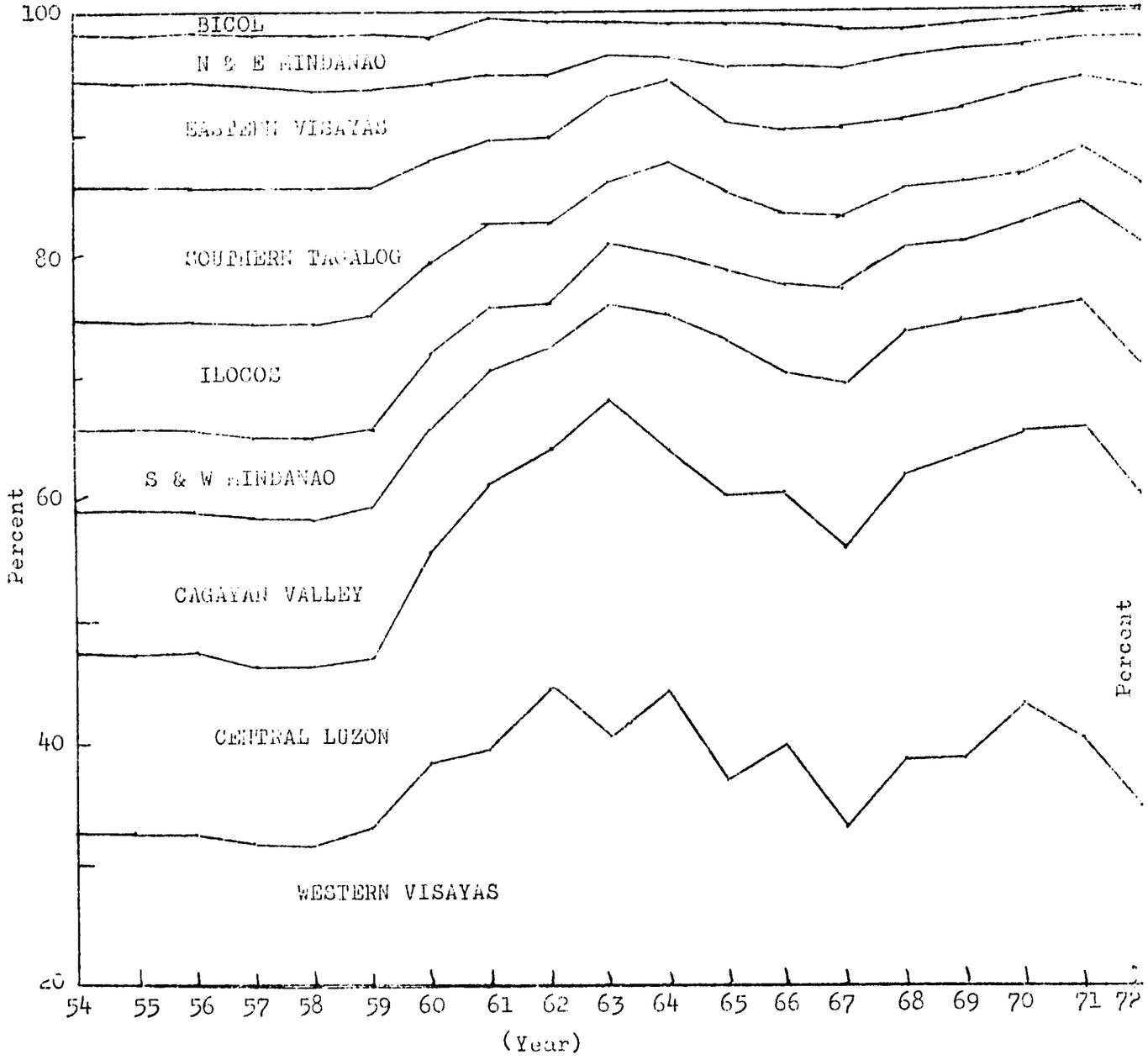

Fig. 9.5. Relative contribution of various regions to total beans and peas area, Philippines, 1954-1972

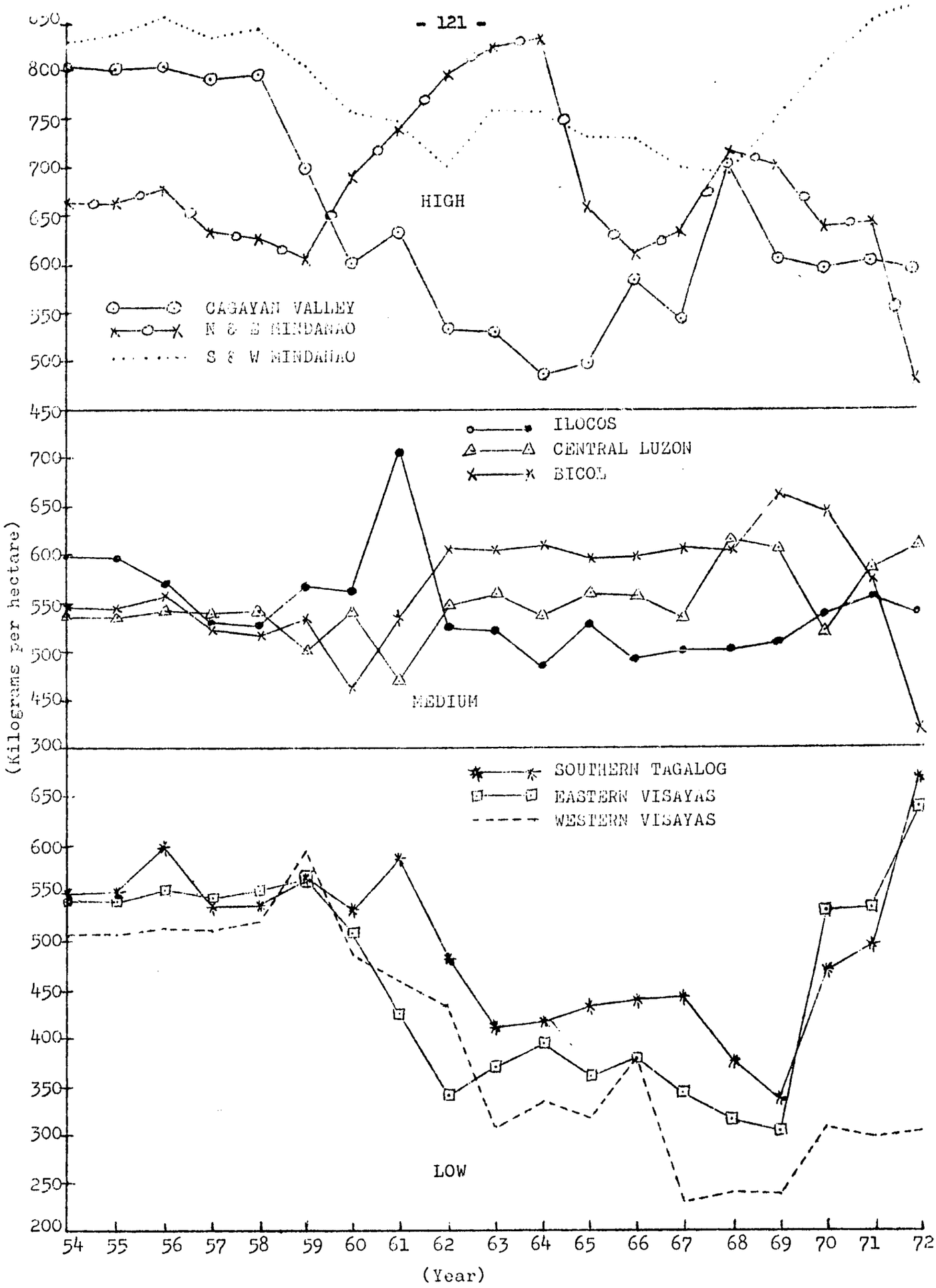

Fig. 9.6. Trends in beans and peas yield in various regions, Philippines, 1954-1972

Western Visayas, which had a negative annual rate of growth of -1.7 per cent, maintained its position as the top contributor to total area ranging from 32.6 to 44.3 per cent (Table 9.4).

Central Luzon ranked second to Western Visayas in beans and peas hectarage followed by Cagayan Valley. The former had a relative contribution ranging from 14 to 27 per cent of the total area.

The least contributors to total beans and peas area were Bicol and Northern and Eastern Mindanao.

Yield variations

From 1954 to 1967, diminishing productivity was apparent in four regions, namely; Southern Tagalog, Eastern Visayas, Western Visayas, and Southern and Western Mindanao (Fig. 9.6). The first three were considered low yielding regions while the last, a high yielding region. The trends in yield of these four regions, however, rose during the last three years.

Medium yielding regions like Central Luzon, Ilocos and Bicol had generally stable patterns in productivity. On the other hand, Cagayan Valley and Northern and Eastern Mindanao, which were high yielding regions had the greatest fluctuations in yield among the nine regions.

Effects of Regional Area Shifts on National Yield

Changes in acreage distribution among regions had a slight negative effect on the national yield of beans and peas (Table 9.5).

Table 9.5. Effects of regional area shifts on the national yield of beans and peas, 1954/58 to 1969/72.

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	590.9	577.5	582.9	582.7
1959/63	538.5	526.9	528.6	528.4
1964/68	454.6	442.4	447.1	448.5
1969/72	489.2	470.0	474.6	477.6
	yield index (1954/58 = 100)			
1954/58	100.0	97.7	98.6	98.6
1959/63	91.1	89.2	89.5	89.4
1964/68	76.9	74.9	75.7	75.9
1969/72	82.8	79.5	80.3	80.8

If regional yields in 1954/58 had not changed, the national yield per hectare would have decreased from 591 in 1954/58 to 583 kilogram in 1969/72. In contrast, if acreage distribution among regions had remained constant between 1954/58 to 1969/72 the national yield would have declined to 489 kilograms instead of the actual yield of 478 kilograms in 1969/72.

The actual national yield was lowest in 1964/68 with 447 kilograms. This was only 76 per cent of the 1954/58 yield and was lower by 5 per cent than the 1969/72 actual yield.

CHAPTER X

CITRUS

Citrus is a tropical and sub-tropical crop that can be grown easily in all parts of the Philippines. However, only less than one per cent of the total crop area was devoted to citrus production during the last two decades. About half of the total citrus area are located in the Southern Tagalog and Bicol regions particularly in the provinces of Batangas and Camarines Sur.

Citrus is composed of calamansi, mandarin, orange and pomelo. Calamansi is mostly grown in Southern Tagalog and Central Luzon; mandarin, in Bicol and also in Southern Tagalog; orange in Southern and Western Mindanao; and pomelo, in Central Luzon.

National Changes in Citrus Production, Area and Yield

Over the 19-year period, the trends in citrus production, area and yield can be characterized by: (1) increasing area and production but relatively stable yield from 1954 to 1959, (2) abrupt increases in production between 1959 to 1962 and 1964 to 1967, but moderate increase in area followed by levelling-off during the same periods, and (3) declines in both production and area but steady increase in yield from 1968 to 1971 (Fig. 10.1).

The annual growth rates in production and yield were 4.2 per cent. Area had a very insignificant growth rate. Hence,

Table 10.1. Growth rates and periodical changes in citrus production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72
	per cent											
Philippines	4.2	99.4	6.7	112.7	nil	42.6	-26.7	4.6	4.2	39.8	45.5	103.4
Ilocos	-3.2	25.8	-46.8	-33.0	-4.7	-34.5	-30.4	-54.4	1.6	92.1	-23.6	46.8
C. Valley	3.1	4.5	124.3	134.4	-0.9	-11.5	-5.1	-16.0	4.0	18.1	135.2	178.9
C. Luzon	-0.6	47.1	-25.7	9.4	1.1	48.3	-5.7	39.9	-1.7	-0.9	-21.2	-21.8
S. Tagalog	-0.7	222.3	-63.0	19.2	-1.6	97.6	-57.2	-15.5	0.9	63.1	-13.6	41.0
Bicol	6.2	103.3	44.0	192.9	3.3	65.7	19.9	98.7	2.9	22.7	20.1	47.4
E. Visayas	1.3	-17.0	24.6	3.5	-1.9	-22.8	-91.7	-35.9	3.3	7.6	1400.1	61.4
W. Visayas	8.8	131.5	55.2	259.1	1.6	51.5	-14.6	29.3	7.1	52.8	81.8	177.8
NE Mindanao	8.6	187.4	47.2	323.0	-2.5	6.3	-32.9	-28.8	11.4	170.4	119.5	493.4
SW Mindanao	7.9	77.2	111.2	274.9	2.3	19.1	12.7	34.2	5.4	48.9	87.8	179.4

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

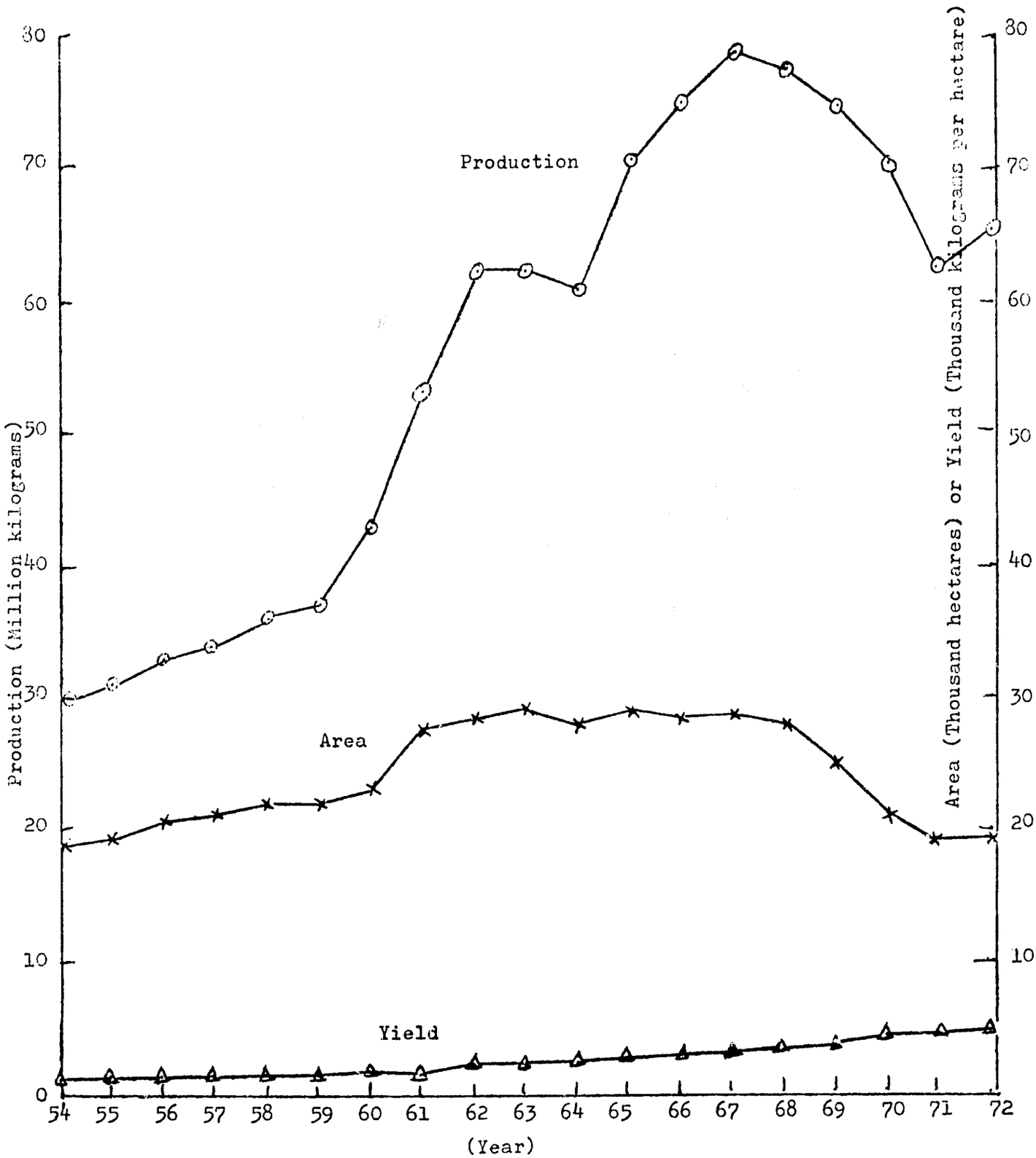

Fig. 10.1. Long-term trends in citrus production, area and yield, Philippines, 1954-1972

Table 10.2. Relative influence of area and yield on citrus production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
		per cent			
1954/57 to 1962/65					
Philippines	99.4	51.4	48.6	nil	100
Ilocos	26.0	-184.0	284.0	nil	100
C. Valley	4.5	-276.2	376.2	nil	100
C. Luzon	47.7	120.2	-220.3	.1	100
S. Tagalog	222.3	58.2	41.8	nil	100
Bicol	103.3	71.1	28.9	nil	100
E. Visayas	-17.0	139.2	-39.2	nil	100
W. Visayas	131.4	49.5	50.5	nil	100
NE Mindanao	187.4	5.8	94.2	nil	100
SW Mindanao	77.2	30.6	69.4	nil	100
1962/65 to 1969/72					
Philippines	6.7	-480.9	580.9	nil	100
Ilocos	-46.8	57.4	42.6	nil	100
C. Valley	124.2	- 6.4	105.9	-.5	100
C. Luzon	-25.6	19.8	80.2	nil	100
S. Tagalog	-63.0	85.3	14.7	nil	100
Bicol	44.0	49.8	50.2	nil	100
E. Visayas	24.6	-1130.8	1230.8	nil	100
W. Visayas	55.2	-36.0	136.0	nil	100
NE Mindanao	47.2	-103.3	203.3	nil	100
SW Mindanao	111.5	15.9	84.1	nil	100
1954/57 to 1969/72					
Philippines	112.7	5.9	94.1	nil	100
Ilocos	-33.0	195.7	-95.7	nil	100
C. Valley	134.4	-20.4	120.4	nil	100
C. Luzon	9.4	375.0	-275.0	nil	100
S. Tagalog	19.2	-95.6	195.6	nil	100
Bicol	192.9	63.9	36.1	nil	100
E. Visayas	3.4	-1310.0	1410.0	nil	100
W. Visayas	259.1	20.1	79.9	nil	100
NE Mindanao	323.0	-23.5	123.5	nil	100
SW Mindanao	274.9	22.2	77.8	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year) - log of area (beginning year); and log P is log of production (ending year) - log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

94 per cent of the change in production was attributed to yield while only 6 per cent, to area for the period from 1954/57 to 1969/72 (Tables 10.1 and 10.2).

Regional Changes in Citrus Production, Area and Yield

Regional variations in production

All regions had positive changes in production from 1954/57 to 1962/65 except Eastern Visayas. In contrast, Ilocos together with Central Luzon, and Southern Tagalog had production decreases from 1962/65 to 1969/72.

The regional changes in production during the first period were due to changes in yield than area except those in Central Luzon, Southern Tagalog, Bicol and the two Visayas regions where changes in area exerted greater effect on production (Table 10.2). On the other hand, changes in area had a greater effect than yield on changes in production in all regions except in Ilocos and Southern Tagalog during the second period.

Annual variations in production

From 1954 to 1959, the behavior of production for all regions was more or less constant, except for Southern Tagalog which showed moderately increasing trend. A marked change started in 1961 when production in Southern Tagalog exhibited an abrupt increase then levelled-off until 1968. This region had the highest citrus production until 1969 when its production dropped to very low level.

Table 10.3. Relative contribution of various regions to total citrus production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	5.1	12.5	12.7	23.7	11.4	9.7	7.7	4.9	12.3	100
1955	5.1	12.5	12.7	23.7	11.4	9.7	7.7	4.9	12.3	100
1956	5.1	12.5	12.7	23.7	11.4	9.7	7.7	4.9	12.3	100
1957	5.1	12.6	12.7	23.6	11.4	9.7	7.8	4.9	12.2	100
1958	5.0	12.5	12.7	24.1	11.4	9.6	7.7	4.8	12.2	100
1959	4.4	11.9	11.8	26.8	11.5	8.9	7.9	4.9	11.9	100
1960	4.5	10.6	11.8	24.6	13.4	7.1	7.7	9.8	10.5	100
1961	4.5	8.0	10.2	37.8	10.5	4.7	7.3	5.7	10.9	100
1962	4.1	6.4	8.9	38.8	10.2	4.3	8.9	9.0	9.4	100
1963	4.0	6.3	9.9	38.9	11.0	4.0	9.1	6.1	10.7	100
1964	3.5	6.6	9.4	40.7	11.4	3.6	9.4	5.3	10.1	100
1965	1.4	7.0	9.3	35.2	13.6	4.3	9.6	7.6	13.0	100
1966	1.3	8.7	9.0	35.0	14.5	4.6	9.2	5.4	12.3	100
1967	1.3	11.4	8.4	33.6	13.4	4.4	10.4	5.1	12.0	100
1968	1.3	14.2	9.6	30.2	13.1	4.6	10.4	6.0	11.6	100
1969	1.3	14.3	6.4	22.7	13.3	3.7	10.9	8.0	10.4	100
1970	1.7	14.6	7.5	11.5	17.5	4.7	12.0	10.8	20.3	100
1971	2.1	16.9	7.1	8.1	15.5	5.1	12.3	9.3	23.6	100
1972	1.2	10.2	5.2	9.4	16.5	5.7	17.5	10.7	23.6	100

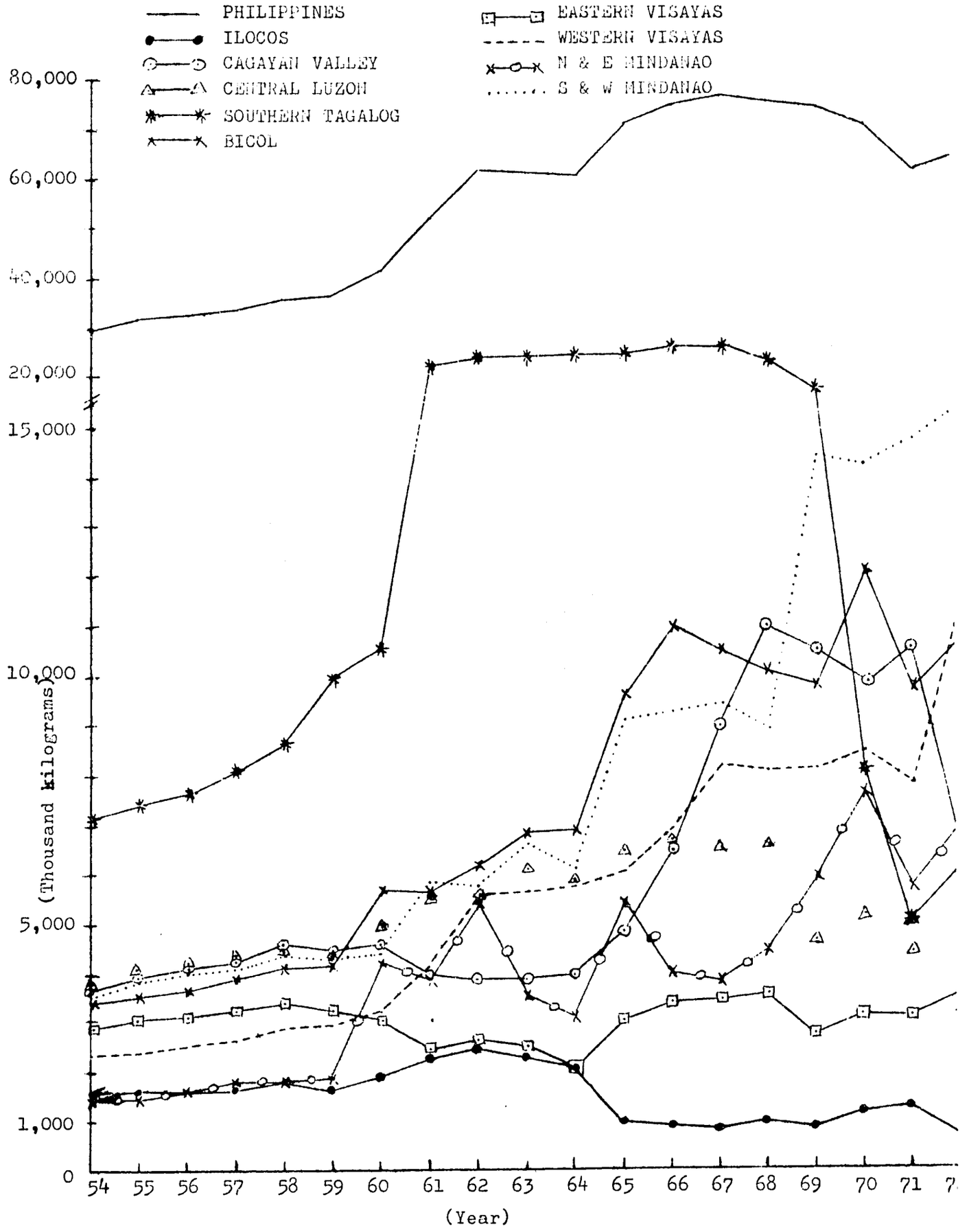

Fig. 10.2. Trends in citrus production by region, Philippines, 1954-1972

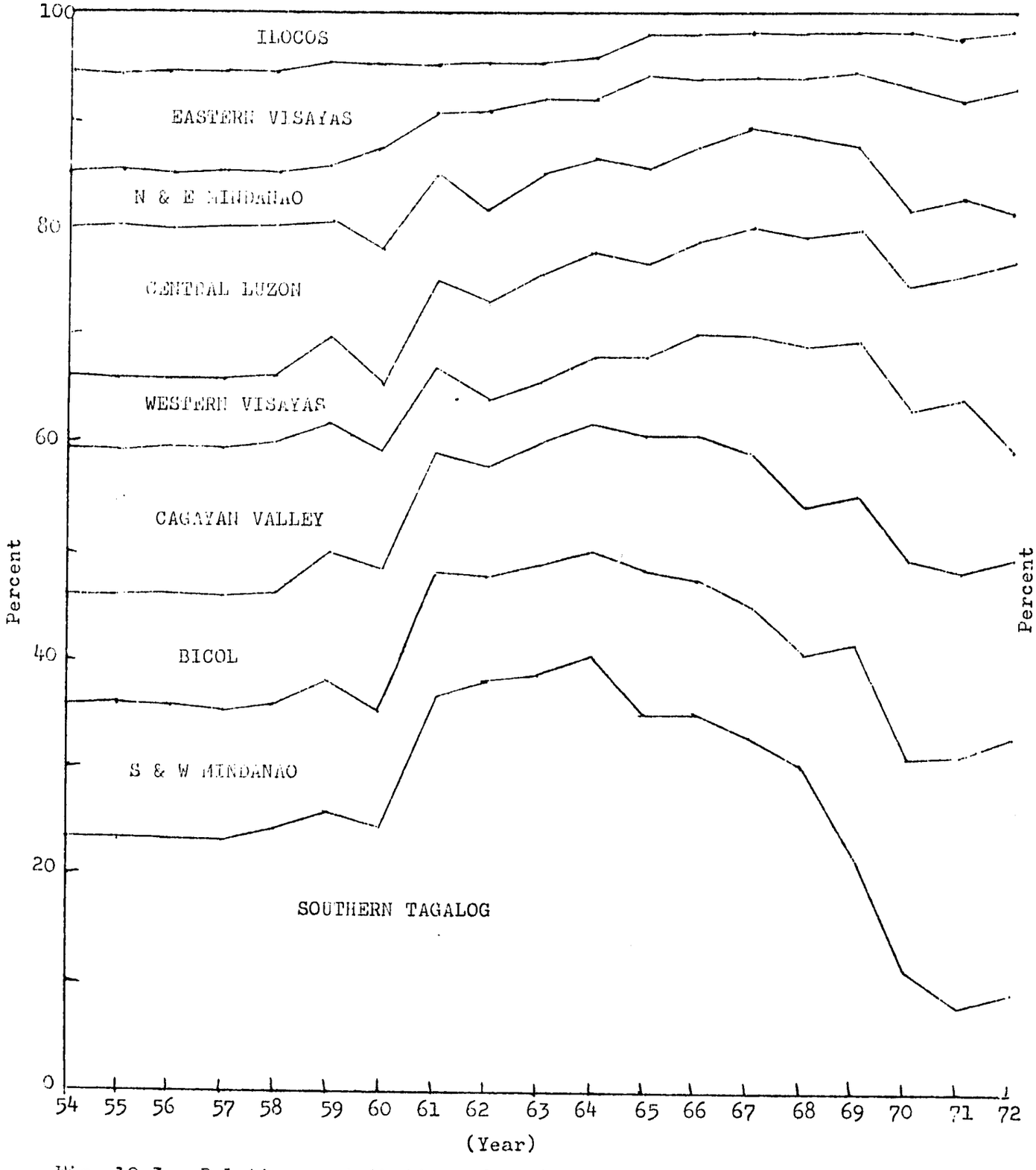

Fig. 10.3. Relative contribution of various regions to total citrus production, Philippines, 1954-1972

Except for Eastern Visayas, Central Luzon and Ilocos, production trends in all regions especially Southern and Western Mindanao were increasing (Fig. 1[illegible].2).

The relative contribution of Southern Tagalog to total citrus production ranged from 24 to 25 per cent from 1954 to 1960; 3[illegible] to 30 per cent from 1961 to 196[illegible], and 23 to 9 per cent from 1969 to 1972. The region registered the highest contribution in 1964 with 4[illegible].7 per cent and the least contribution in 1971 with [illegible].1 per cent only.

Southern and Western Mindanao ranked next in terms of citrus production although its contribution to the total output from 1954 to 196[illegible] was only about half that of Southern Tagalog. During the last three years, Southern and Western Mindanao displaced Southern Tagalog as the top citrus producer among the nine regions. Bicol ranked third with shares to total output ranging from 1[illegible] to 17 per cent during the entire period.

Central Luzon had a declining relative contribution ranging from 12.7 per cent in 1954 to 5.2 per cent in 1972. The same holds true for Ilocos, the region with least citrus production.

Area variations

In general, total hectarage trend planted to citrus showed an increasing trend from 1954 up to 1963, levelled-off from 1964 to 1967, and declined from 1968 to 1972. Southern Tagalog, which had the largest citrus hectarage among the nine regions, exhibited more or

Table 10.4. Relative contribution of various regions to total citrus area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	8.0	9.3	11.2	30.9	9.4	7.0	9.6	5.9	8.7	100
1955	7.7	10.5	10.8	30.6	9.3	7.2	9.3	5.7	8.9	100
1956	8.0	10.5	10.7	30.3	9.3	7.2	9.3	5.7	9.0	100
1957	7.8	10.5	10.8	30.3	9.3	7.2	9.4	5.7	9.0	100
1958	7.9	10.5	10.6	30.4	9.3	7.1	9.5	5.7	9.0	100
1959	6.5	10.4	10.8	32.5	9.6	6.2	9.8	5.8	8.4	100
1960	5.4	9.0	10.1	38.3	10.5	5.7	7.1	6.1	7.9	100
1961	4.3	7.9	10.9	42.2	10.8	4.2	7.2	3.7	7.8	100
1962	4.0	5.6	9.6	41.7	11.0	4.3	10.1	6.8	6.8	100
1963	3.9	6.1	12.2	41.5	11.1	4.1	9.8	3.8	7.5	100
1964	3.5	6.6	11.5	42.8	10.1	4.0	10.5	3.2	7.9	100
1965	2.9	7.0	11.9	43.0	11.2	3.1	9.7	3.4	7.5	100
1966	2.8	6.9	11.8	42.8	12.0	3.2	9.6	3.4	7.5	100
1967	2.7	7.0	12.1	42.2	11.9	3.1	9.4	3.1	7.9	100
1968	3.0	6.8	13.6	40.2	12.5	3.3	9.9	3.1	7.6	100
1969	3.3	7.5	12.9	39.5	14.0	3.5	10.3	3.3	9.7	100
1970	3.4	8.2	15.3	18.2	22.7	4.4	12.2	5.2	10.4	100
1971	3.8	9.4	16.6	19.4	17.5	5.1	11.7	3.7	12.8	100
1972	3.2	7.9	13.9	22.6	17.5	4.9	12.9	3.6	13.5	100

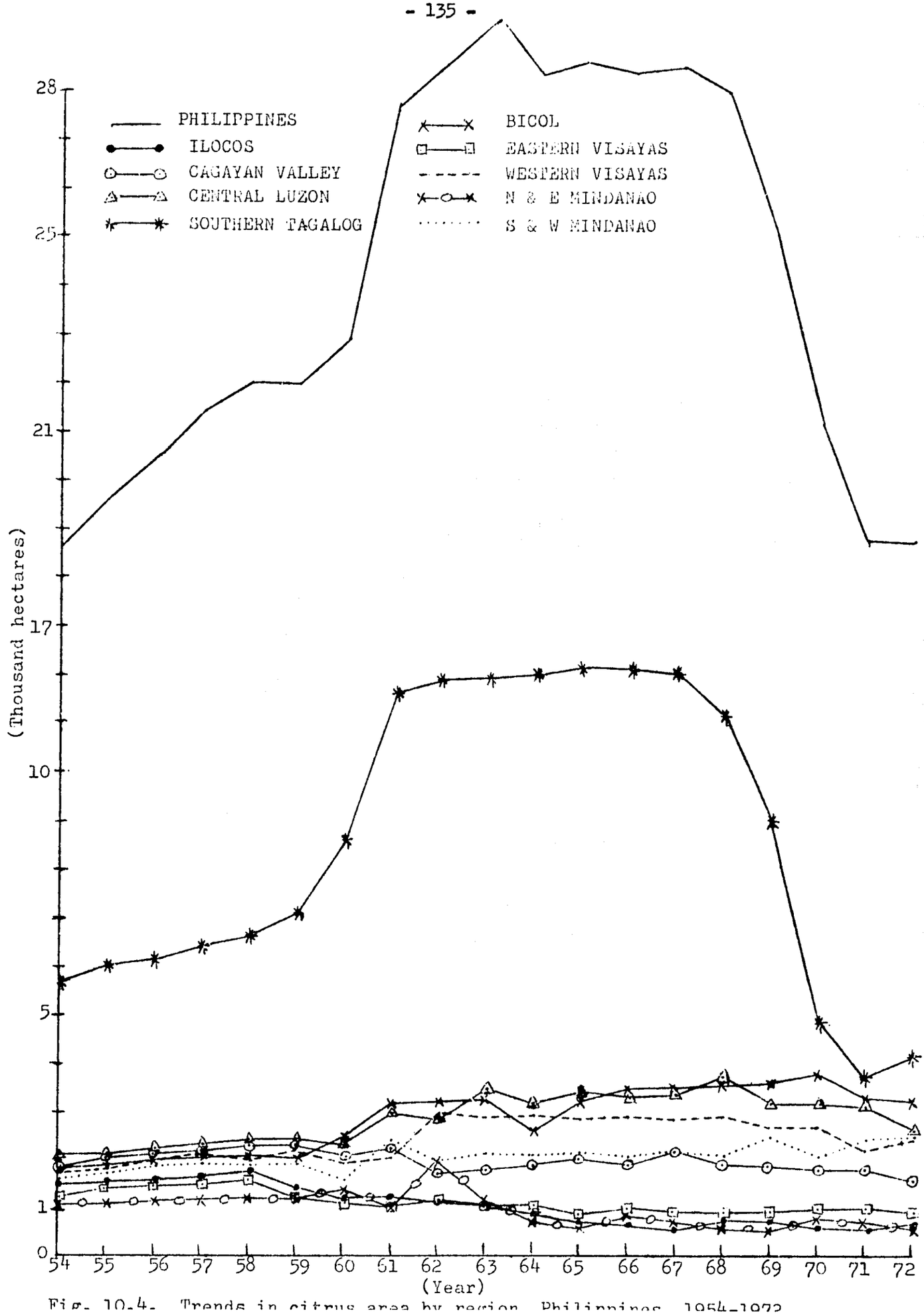

Fig. 10.4. Trends in citrus area by region, Philippines, 1954-1972

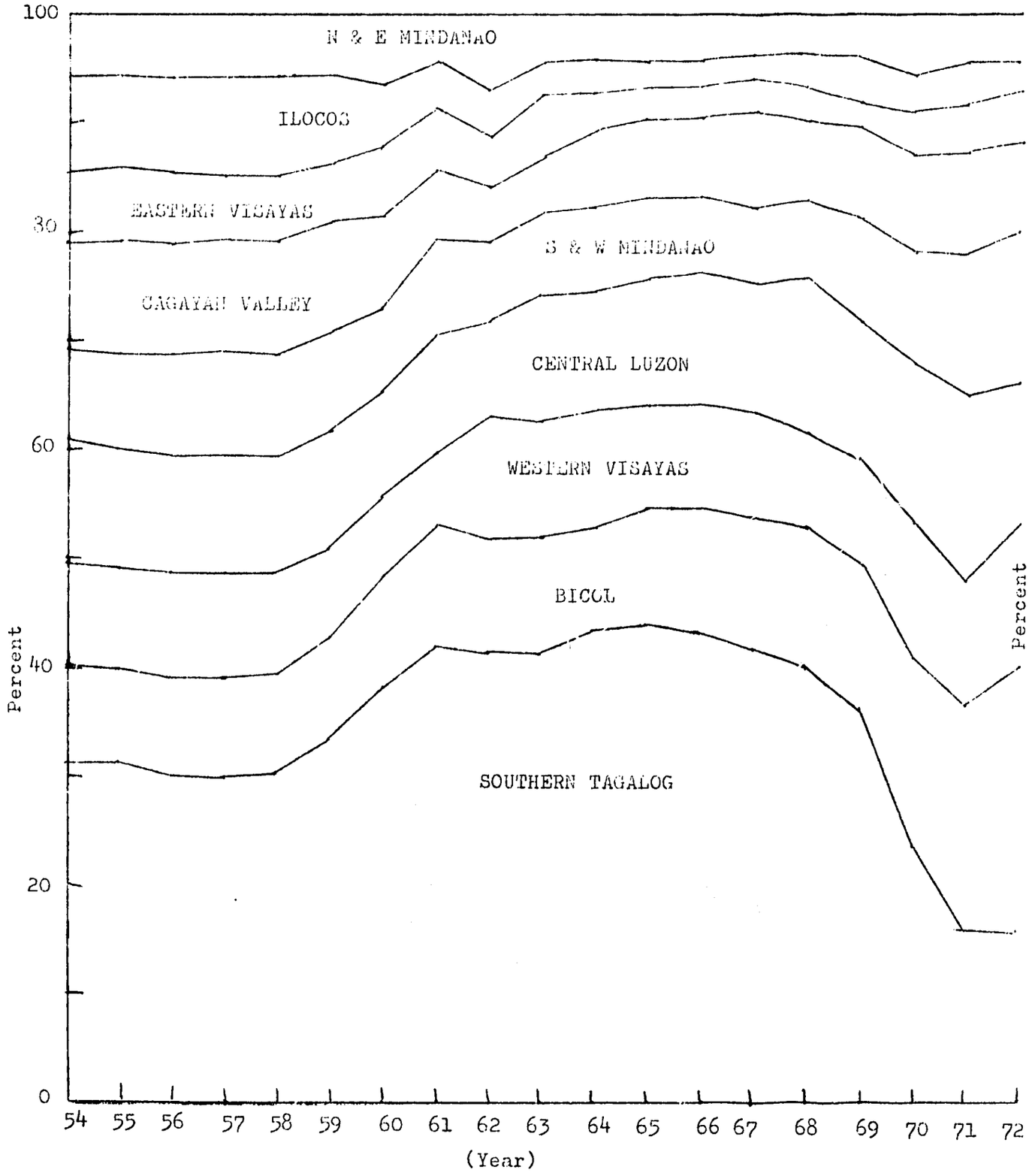

Fig. 10.5. Relative contribution of various regions to total citrus area, Philippines, 1954-1972

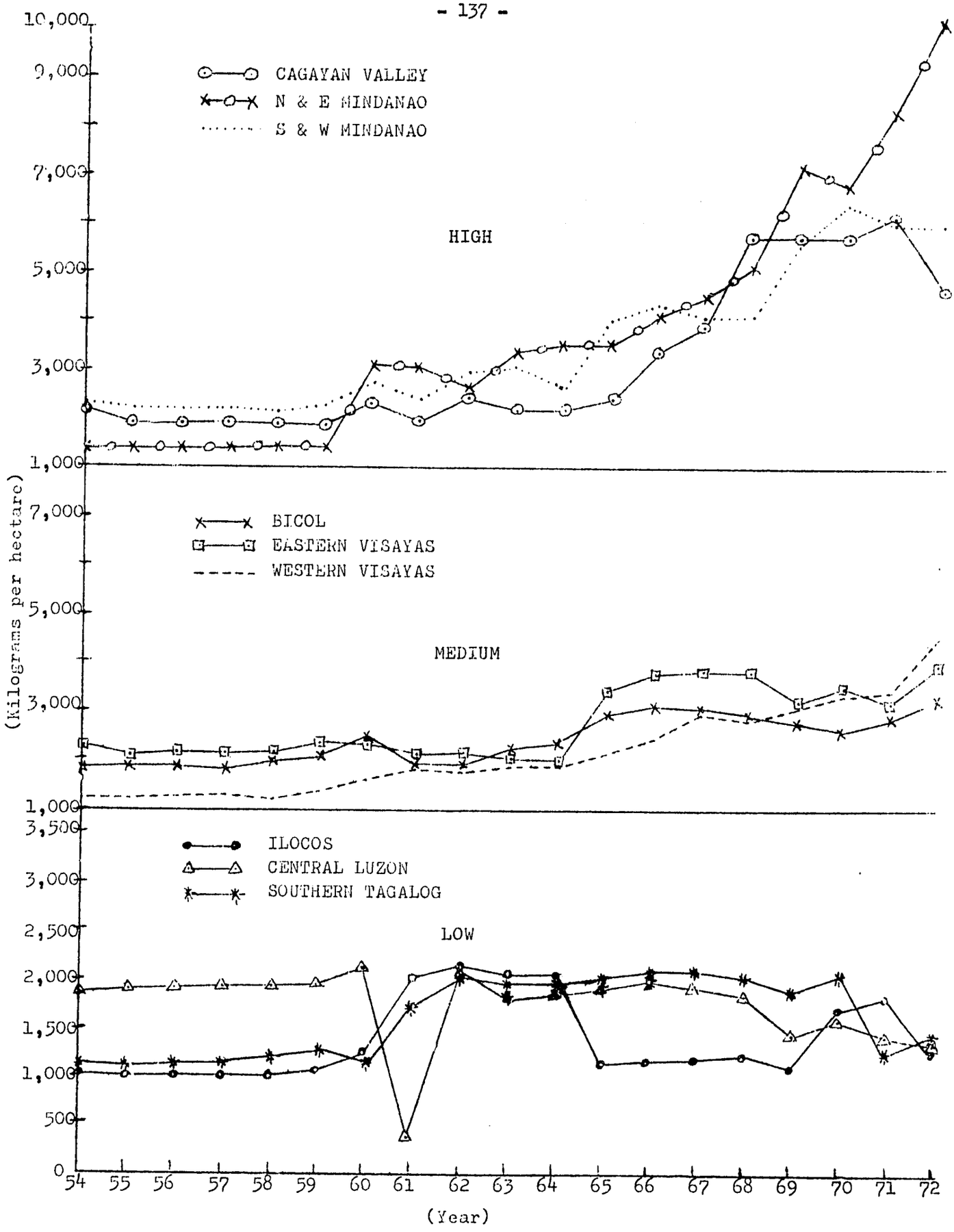

Fig. 10.6. Trends in citrus yield in various regions, Philippines, 1954-1972

less the same area trend as that of the national level (Fig. 10.4 and 10.5 and Table 10.4).

All regions had stable area during the first six years. Starting 1961, the hectarage trend of Eastern Visayas, Ilocos and Northern and Eastern Mindanao slightly declined; that of Cagayan Valley remained stable and the area trend of the rest of the regions increased slightly.

The relative contribution of Southern Tagalog to total citrus area ranged from 30 to 42 per cent from 1954 to 1969 and declined to 18 to 22 per cent during the last three years. The other top two producing regions are Bicol and Central Luzon with a share each to total area ranging from 9 to 17 per cent.

Yield variations

Citrus yield per hectare showed increasing trends in all regions of the country except in Central Luzon which had a negative growth rate of -1.7 per cent per year. The highest annual rate of growth in productivity was in Northern and Eastern Mindanao with 11.4 per cent followed by Western Visayas with 7.1 per cent and Southern and Western Mindanao with 5.4 per cent.

Northern and Eastern Mindanao, Southern and Western Mindanao, and Cagayan Valley were considered high yielding regions with rapidly increasing trends in productivity. On the other hand, Bicol and the two Visayas regions were categorized as medium yielding regions whose

Table 10.5. Effects of regional area shifts on the national yield of citrus, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	1,687.8	1,569.6	1,569.7	1,683.6
1959/63	2,022.5	1,982.7	1,959.1	2,042.0
1964/68	2,690.4	2,614.7	2,558.3	2,727.3
1969/72	3,248.2	3,028.6	2,885.6	3,253.4
	Yield index (1954/58 = 100)			
1954/58	100.0	97.6	97.6	104.7
1959/63	125.8	123.3	121.8	127.0
1964/68	167.3	162.6	159.1	169.6
1969/72	202.0	188.4	179.5	202.4

productivities were slightly increasing. The rest of the regions belonged to the low yielding group whose productivities were relatively stable (Fig. 10.6).

Effects of Regional Area Shifts on National Yield

If regional yields had remained constant changes in acreage distribution among regions would have decreased the overall yield of citrus during the second and third periods (1959/63 and 1964/68) but would have increased the national yield during the last period (1969/72) (Table 10.5). This indicates that there was a shift in area concentration from higher to lower yielding regions than from lower to higher yielding regions.

The yield index also shows that if 1954/58 regional yields had remained constant, the national yield would have declined to 97.6 per cent in 1959/63 and 1964/68 but would have risen to 104.7 per cent in 1969/72. Much of the increase in productivity of citrus occured during the last four years.

CHAPTER XI

COCONUT

Coconut has consistently been one of the ten principal exports of the Philippines. In 1972 alone, value of exports from coconut products was more than one-fourth of the top ten principal exports or one-fifth of the value of all Philippine exports that year.[13/]

The coconut industry is also the source of livelihood of about one-third of the country's population. Moreover, approximately one-fifth of the total crops area were planted to coconut.

National Changes in Coconut Production, Area and Yield

During the 19-year period under review, coconut production and area increased considerably with annual growth rates of 3.2 and 4.1 per cent respectively. In contrast, yield decreased at the rate of 0.8 per cent annually (Table 11.1).

The periods 1954/57 to 1962/65 and 1954/57 to 1969/72 showed that production had an average increase of 37.4 and 46.0 per cent, respectively. During the same periods, average changes in area were 49.4 and 99.4 per cent in that order while decreases in yield were -5.5 and -26.7 per cent. The decrease in national yield between

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13/ Coconut Statistics, Vol. VI No. 4 United Coconut Association of the Philippines, Manila, 1973.

Table 11.1. Growth rates and periodical changes in coconut production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72
	per cent											
Philippines	3.2	37.4	6.3	46.0	4.1	49.4	37.1	99.4	-0.8	-5.5	-22.6	-26.7
Ilocos	0.6	60.3	-29.4	13.0	-1.0	-2.0	27.4	24.8	1.6	63.3	-44.6	-9.6
C. Valley	3.4	150.2	-48.6	28.7	1.5	11.1	-85.7	72.4	1.8	-79.2	259.5	-25.1
C. Luzon	-2.1	49.1	-56.4	-34.9	-1.5	18.9	-39.7	-28.3	-0.6	25.3	-27.5	-9.1
S. Tagalog	-2.4	1.6	-54.5	-53.8	2.4	8.3	27.4	38.0	-4.8	-6.2	-64.4	-66.6
Bicol	-6.0	-3.2	-57.3	-58.6	0.7	-72.9	21.5	-67.0	-6.6	255.4	-64.8	25.4
E. Visayas	4.1	30.7	61.8	111.4	3.9	52.0	31.4	99.6	0.2	-14.0	23.1	6.0
W. Visayas	3.2	94.3	-17.0	161.3	2.6	28.5	17.8	51.4	0.6	51.1	-29.4	6.5
NE Mindanao	5.6	64.2	15.0	88.7	7.4	128.4	41.0	222.0	-1.6	-28.0	-18.4	-41.3
SW Mindanao	10.1	141.2	89.3	357.9	7.6	110.8	78.1	275.5	2.4	14.4	6.6	21.8

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

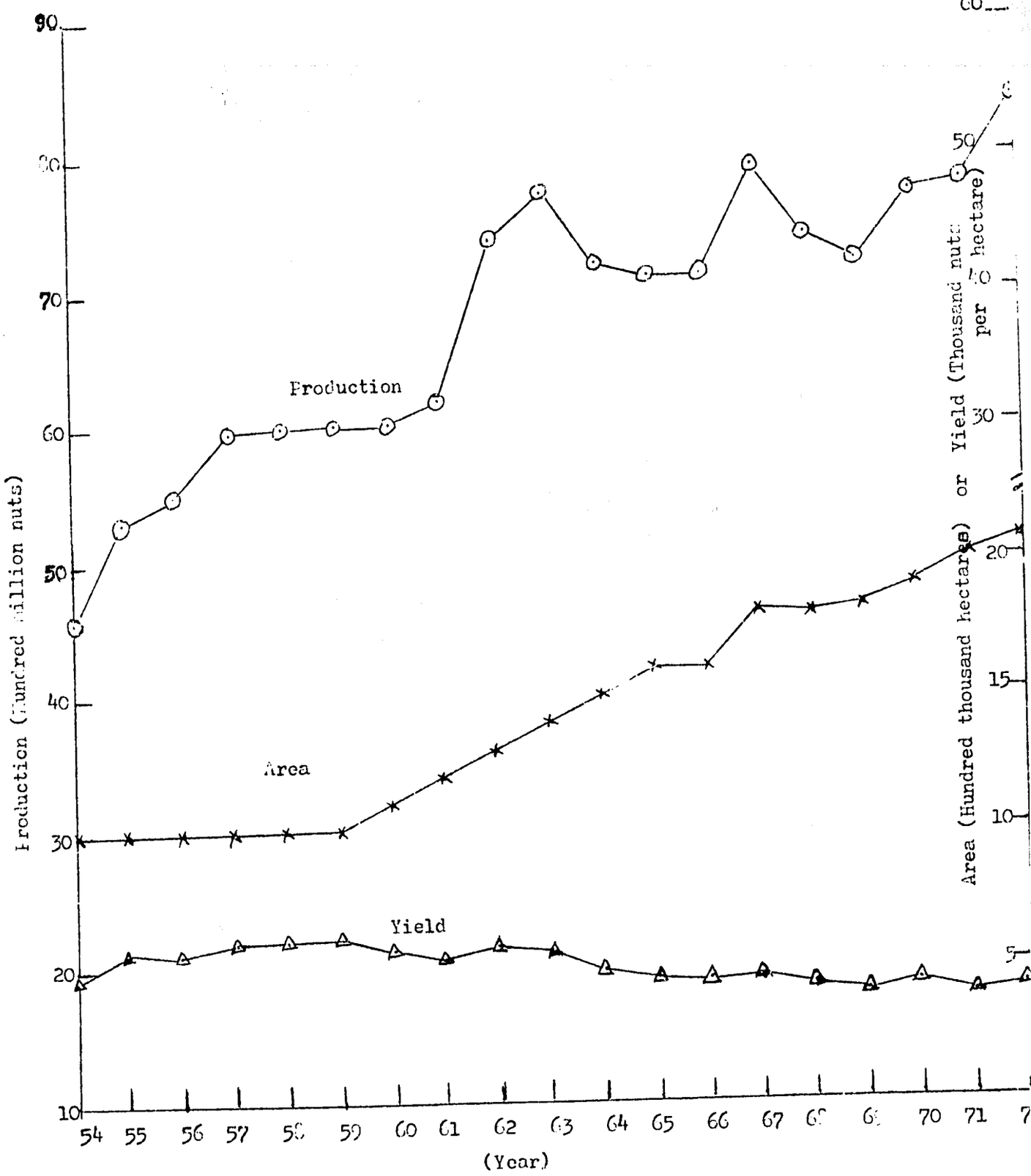

Fig. 11.1. Long-term trends in coconut production, area and yield, Philippines, 1954-1972

Table 11.2. Relative influence of area and yield on coconut production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
1954/57 to 1962/65					
Philippines	37.4	117.[illegible]	-1[illegible].0	.2	100
Ilocos	6[illegible].3	- 4.4	104.0	.4	100
C. Valley	150.2	271.0	-171.2	-.5	100
C. Luzon	1[illegible].1	43.4	56.5	.1	100
S. Tagalog	2.0	49[illegible].2	-394.5	-1.7	100
Bicol	- 3.2	3349.1	-3249.1	nil	100
E. Visayas	30.7	150.6	-50.2	.4	100
W. Visayas	94.3	37.[illegible]	62.1	.1	100
NE Mindanao	64.2	166.0	-66.3	-.3	100
SW Mindanao	141.2	84.7	15.3	nil	100
1962/65 to 1969/72					
Philippines	6.3	515.9	-417.6	1.7	100
Ilocos	-29.4	-69.5	169.3	.2	100
C. Valley	-48.6	292.9	-192.5	-.4	100
C. Luzon	-56.4	61.1	38.[illegible]	.1	100
S. Tagalog	-54.5	-30.8	131.[illegible]	-.2	100
Bicol	-57.3	-22.9	122.6	.3	100
E. Visayas	61.8	56.7	43.3	nil	100
W. Visayas	-17.0	-88.0	187.7	.3	100
NE Mindanao	15.6	245.9	-145.9	nil	100
SW Mindanao	89.3	90.0	9.9	nil	100
1954/57 to 1969/72					
Philippines	46.0	182.1	-8[illegible].0	-.1	100
Ilocos	13.0	1[illegible]1.0	-8[illegible].2	1.2	100
C. Valley	28.7	215.9	-114.6	-1.3	100
C. Luzon	-34.9	77.5	22.3	.2	100
S. Tagalog	-53.8	-41.8	141.9	-.2	100
Bicol	-58.6	125.5	-25.6	.1	100
E. Visayas	111.4	92.4	7.7	-.1	100
W. Visayas	161.3	86.7	13.3	nil	100
NE Mindanao	8[illegible].7	184.0	-8[illegible].9	-.1	100
SW Mindanao	357.9	87.0	13.0	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year)-log of area (beginning year); and log P is log of production (ending year)-log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

1954/57 and 1969/72 was greatly influenced by yield decreases in Southern Tagalog (-66.6%), Northern and Eastern Mindanao (-41.3%) and Cagayan Valley (-25.1%).

Regional Changes in Coconut Production, Area and Yield

Regional variations in production

Increased production of coconut in Ilocos, Cagayan Valley and Northern and Eastern Mindanao between 1954/57 and 1969/72 resulted from the expansion of areas devoted to coconut in these regions. During the same period, positive changes in production were also noted in Southern and Western Mindanao and the two Visayas regions owing to increases in both area and yield. However, area had a greater effect on production than yield (Table 11.2). Likewise, negative changes in production in Central Luzon and Bicol were influenced more by area than yield. On the other hand, yield had a greater influence on the decreased in production in Southern Tagalog.

Annual variations in production

Coconut production in the Philippines from 1954 to 1972 depicted a moderately increasing trend with annual rate of growth of 3.2 per cent.

Southern Tagalog region, the highest coconut producer for the first ten-year period (1954-1964), exhibited a downward trend in production from 1965 to 1972 with a negative growth rate of -2.4 per cent per year. Its nuts production of more than a billion (the

Table 11.3. Relative contribution of various regions to total coconut production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	0.1	0.2	1.1	33.4	16.4	16.3	7.8	13.8	10.9	100
1955	0.1	0.2	1.1	33.4	16.4	16.4	7.8	13.8	10.8	100
1956	0.1	0.2	1.1	33.5	16.4	16.3	7.8	13.8	10.8	100
1957	0.1	0.2	1.1	33.4	16.4	16.3	7.8	13.8	10.9	100
1958	0.1	0.2	1.1	33.5	16.4	16.3	7.8	13.8	10.8	100
1959	0.2	0.3	1.2	33.8	16.3	16.1	7.5	14.0	10.6	100
1960	0.2	0.3	1.0	40.0	14.3	11.2	7.8	16.1	9.7	100
1961	0.3	0.4	2.1	29.4	12.1	12.0	6.8	22.9	14.0	100
1962	0.2	0.3	1.5	27.9	9.9	16.1	11.1	19.2	13.8	100
1963	0.1	0.3	1.5	26.1	10.8	13.5	11.6	17.0	19.1	100
1964	0.2	0.3	1.5	25.0	12.6	13.0	12.5	16.8	18.9	100
1965	0.1	0.3	0.2	19.7	13.1	19.8	8.7	13.4	24.7	100
1966	0.1	0.3	0.7	14.1	13.1	21.3	8.8	14.9	26.7	100
1967	0.2	0.2	0.6	16.8	11.1	20.9	8.6	13.8	27.8	100
1968	0.1	0.2	0.8	11.1	5.5	22.9	9.6	18.8	31.9	100
1969	0.1	0.2	0.7	10.3	6.4	25.7	10.0	19.0	27.6	100
1970	0.1	0.1	0.6	10.7	5.9	26.7	7.7	14.6	33.6	100
1971	0.1	0.1	0.4	9.8	3.7	23.6	9.0	16.3	37.0	100
1972	0.1	0.1	0.4	11.4	2.8	19.1	7.9	21.1	37.1	100

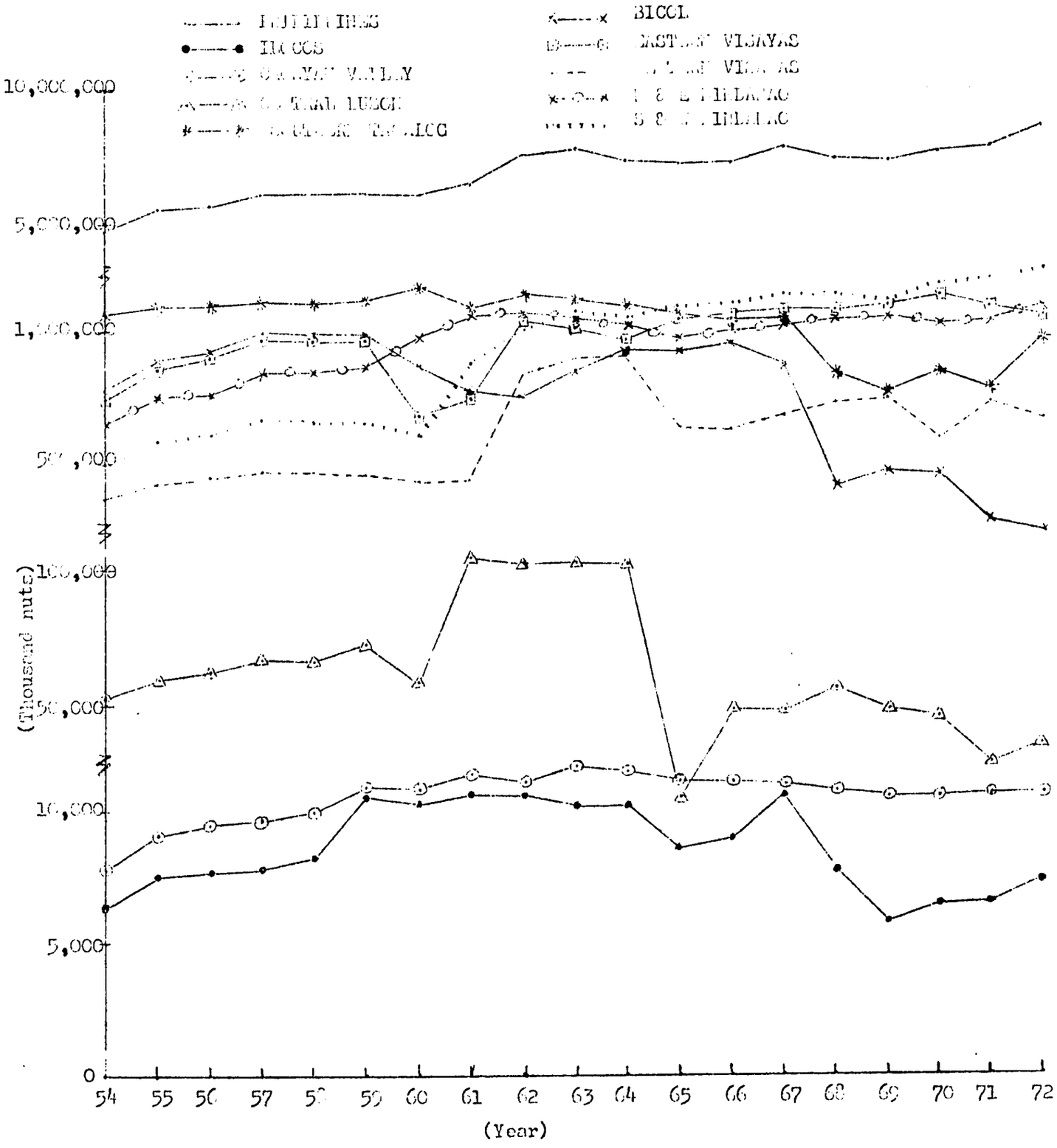

Fig. 11.2. Trends in coconut production by region, Philippines, 1954-1972

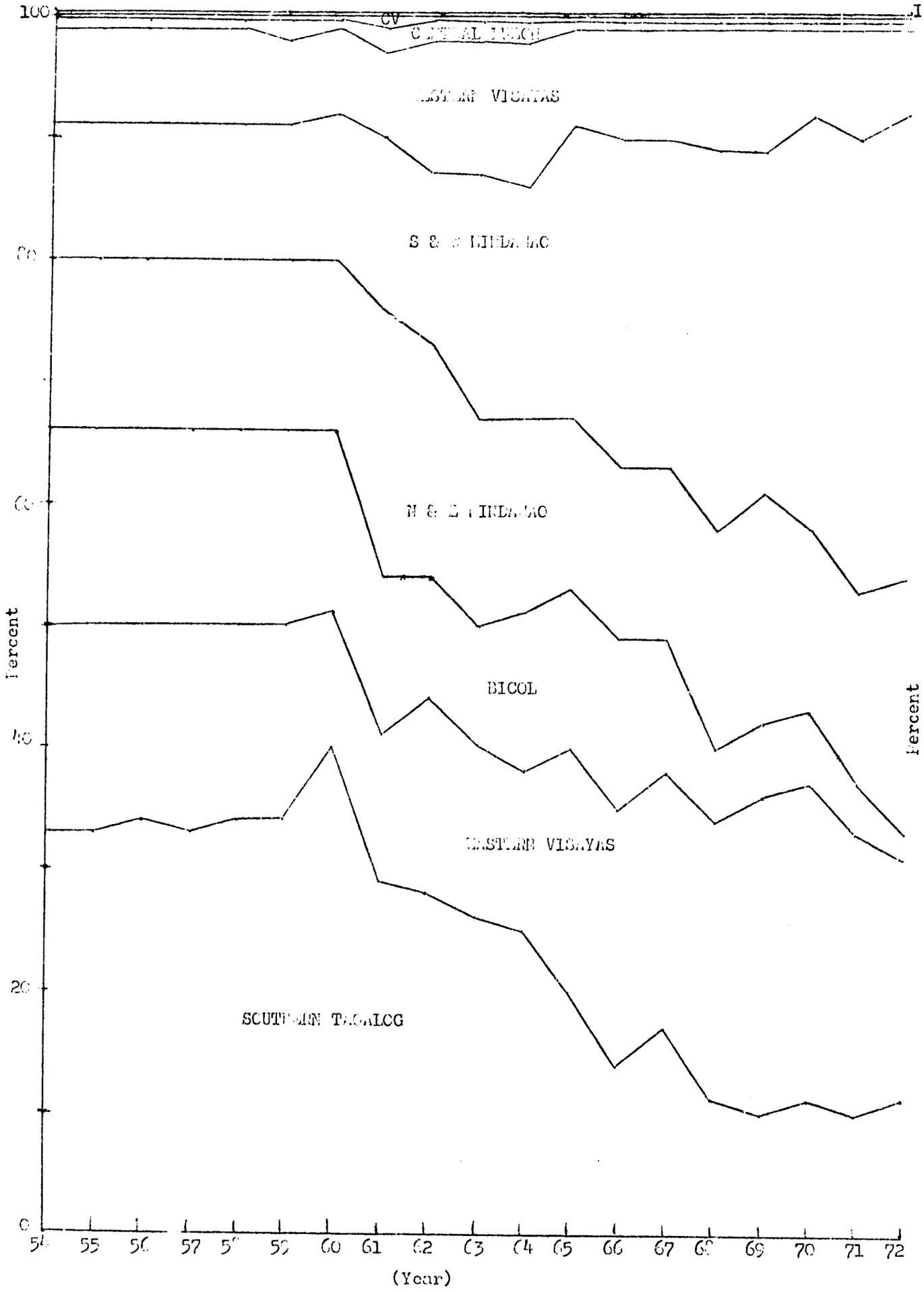

Fig. 11.3. Relative contribution of various regions to total coconut production,

highest being 2.4 billion nuts in 1960) started to shrink to less than a million in 1968. Cagayan Valley, the second lowest coconut producing region, registered an annual growth rate of 3.4 per cent. Southern and Western Mindanao registered the highest annual growth rate with 10.1 per cent followed by Northern and Eastern Mindanao with 5.6 per cent per year (Fig. 11.2 and Table 11.1). These regions started to produce over a billion nuts in the early 60's and improved further in subsequent years. Southern and Western Mindanao's production surpassed all other regions from 1965 to 1972. The highest production of the region was in 1972 with 3.1 billion nuts.

Ilocos, Cagayan Valley, and Central Luzon contributed less than 3.0 per cent to the total coconut production from 1954 to 1972. On the other hand, Southern Tagalog and Bicol had the most contribution during the first half of the whole period since there was a decreasing trend in production in these regions during the second half. From a level of 33.4 per cent in 1954, Southern Tagalog's relative contribution increased by 6.6 per cent more in 1960. However, its contribution rapidly went down to only 9.8 and 11.4 per cent in 1971 and 1972, respectively. Combining Southern Tagalog with Bicol, these two regions accounted for 49.8 per cent of the total coconut production in 1954, increased to 54.3 per cent in 1960, but declined to only 14.2 per cent in 1972.

Table 11.4. Relative contribution of various regions to total coconut area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	0.3	0.4	1.3	25.9	18.7	20.1	9.8	11.6	11.9	100
1955	0.3	0.4	1.3	25.9	18.7	20.1	9.8	11.6	11.9	100
1956	0.3	0.4	1.3	25.9	18.7	20.1	9.8	11.6	11.9	100
1957	0.3	0.4	1.3	25.9	18.7	20.1	9.8	11.6	11.9	100
1958	0.3	0.4	1.3	25.9	18.7	20.1	9.8	11.6	11.9	100
1959	0.3	0.4	1.9	24.9	19.2	18.7	9.5	12.4	12.7	100
1960	0.2	0.4	1.1	24.8	16.9	16.3	10.1	16.7	13.9	100
1961	0.2	0.4	1.5	23.[illegible]	13.0	18.0	9.9	18.8	14.4	100
1962	0.2	0.4	1.4	22.0	13.4	19.6	9.6	18.6	14.3	100
1963	0.2	0.4	1.3	19.9	13.0	19.0	9.0	19.1	18.1	100
1964	0.2	0.4	1.0	16.7	14.7	20.7	8.4	18.5	17.4	100
1965	0.2	0.4	0.6	17.0	14.4	24.3	7.9	17.0	18.2	100
1966	0.2	0.4	0.6	17.1	14.8	23.8	7.0	16.9	18.4	100
1967	0.2	0.3	0.5	14.4	19.3	23.5	7.1	16.0	18.2	100
1968	0.2	0.6	0.5	17.6	17.1	21.5	8.0	14.9	19.6	100
1969	0.2	0.5	0.5	17.3	14.5	20.9	7.8	17.7	20.6	100
1970	0.2	0.6	0.5	17.5	12.8	20.5	7.6	17.7	22.6	100
1971	0.1	0.3	0.4	17.5	12.5	20.0	7.0	18.5	23.7	100
1972	0.1	0.3	0.4	19.2	10.0	19.4	7.5	20.9	22.2	100

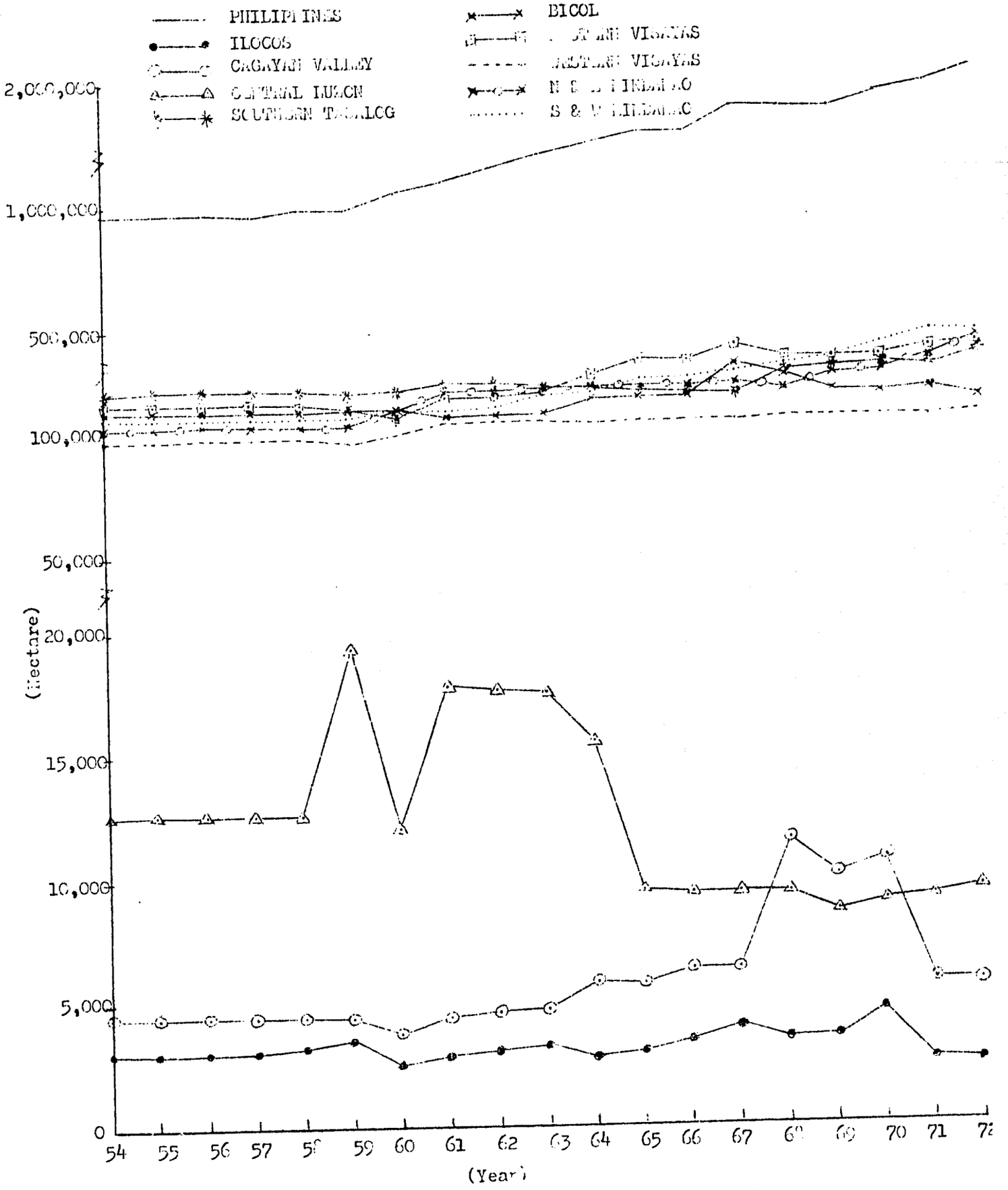

Fig. 11.4. Trends in coconut area by region, Philippines, 1954-1972

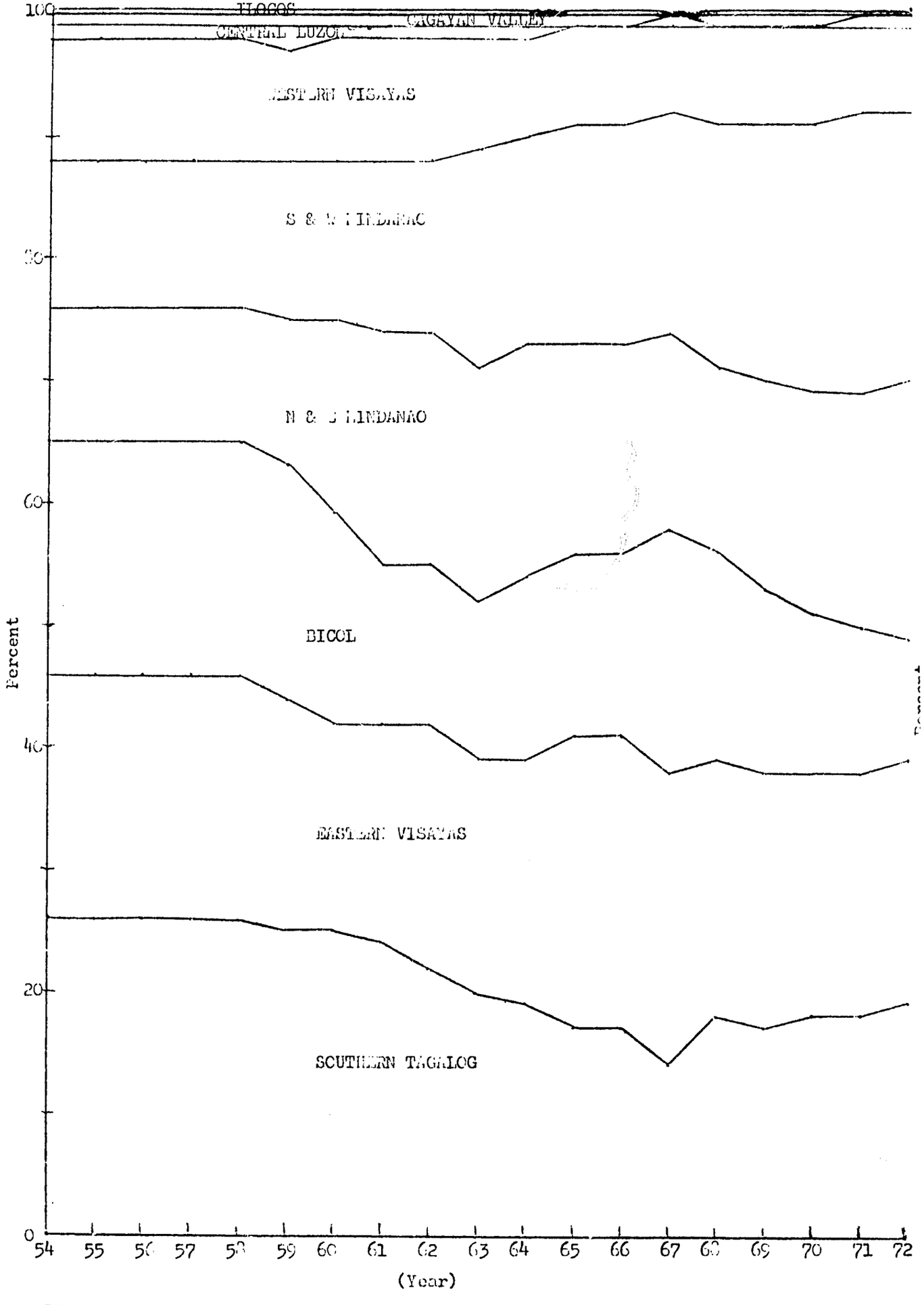

Fig. 11.5. Relative contribution of various regions to total coconut area,

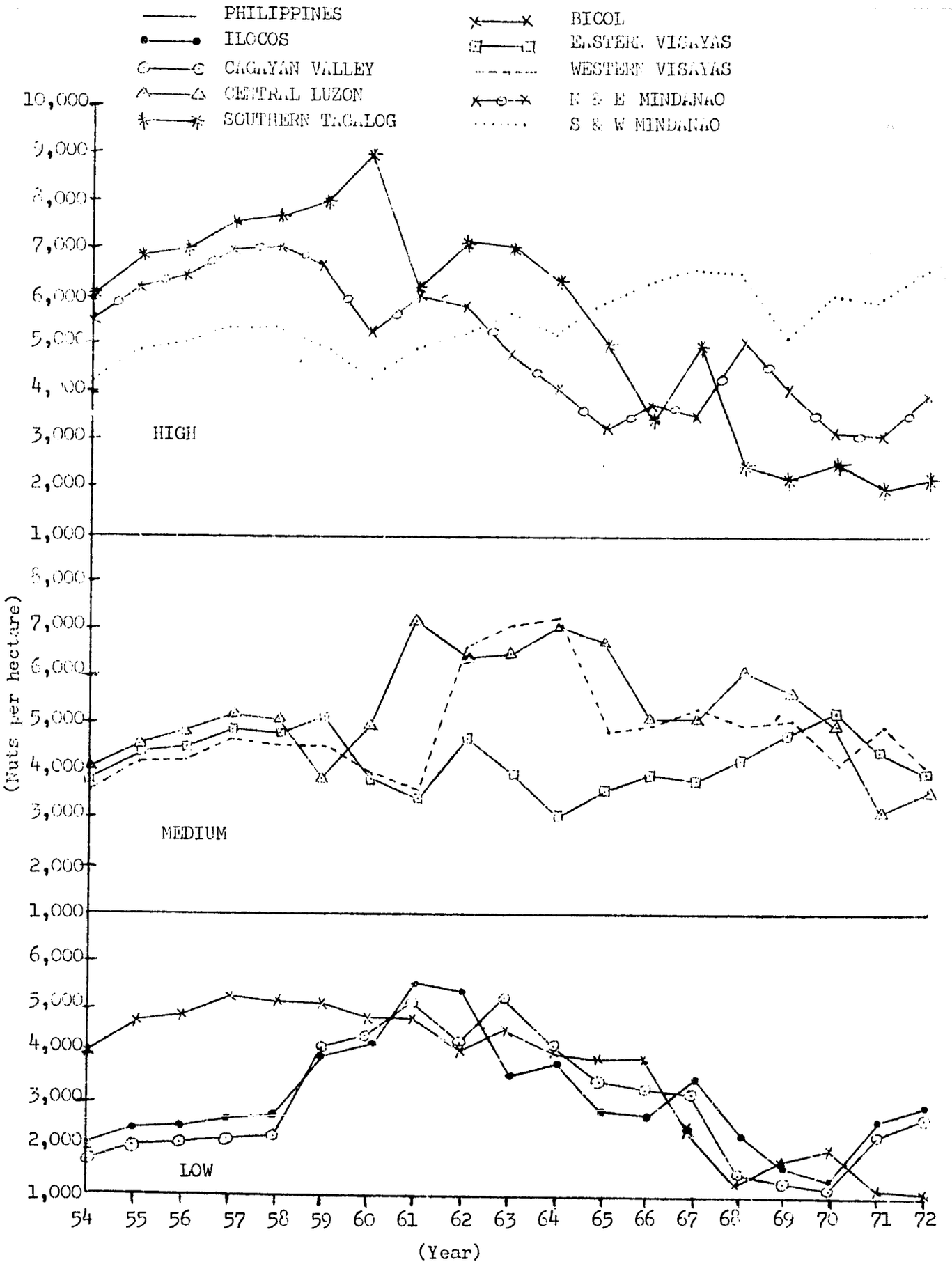

Fig. 11.6. Trends in coconut yields in various regions, Philippines, 1954-1972

Southern and Western Mindanao replaced Southern Tagalog as top coconut-producing region from 1965 up to 1972. The region's contribution to total output continued to rise until 1972 when it reached its peak of 37.1 per cent.

From a low combined contribution of 24.7 per cent in 1954, the two Mindanao regions ended up with as high as 56.2 per cent in 1972. Eastern Visayas also exhibited a relatively high contribution to coconut production ranging from 11.20 per cent in 1960 to 26.7 per cent in 1970 (Table 11.3).

Area Variations

The total area devoted to coconut showed a consistently increasing trend at the rate of 4.1 per cent annually. It showed average changes of 47.4, 37.1, and 99.4 per cent during the periods 1954/57 to 1962/65, to 1969/72 and 1954/57 to 1969/72, respectively.

Both Ilocos and Central Luzon showed entirely different area trends from most of the regions with negative rates of growth of -1.6 and -1.5 per cent annually, respectively. Southern and Western Mindanao had the highest rate of increase of 7.6 per cent per year and Northern and Eastern Mindanao, second with 7.4 per cent. For the period 1954/57 to 1969/72, the former showed an average change of 275.5 per cent and the latter, 222.0 per cent (Table 11.4).

From 1954 to 1962, the relative contribution of Southern Tagalog to total coconut area ranged from 22.0 to 25.9 per cent. Impressive acreage increases in the two Mindanao regions resulted in their

Table 11.5. Effects of regional area shifts on the national yield of coconut, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	nuts per hectare			
1954/58	5,515.2	5,500.4	5,411.2	5,491.3
1959/63	5,615.7	5,613.5	5,411.0	5,492.0
1964/68	4,324.4	4,421.6	4,411.7	4,542.1
1969/72	3,477.4	3,601.9	3,814.3	3,951.2
	yield index (1954/58 = 100)			
1954/58	100.0	100.8	98.1	99.6
1959/63	101.8	101.8	98.1	99.6
1964/68	78.4	80.2	78.0	82.4
1969/72	63.0	66.4	69.2	71.6

relative contribution of almost 50 per cent of the total acreage. Since 1964 to 1969, Eastern Visayas replaced Southern Tagalog as the region with the largest coconut hectarage but Southern and Western Mindanao topped all regions during the last three years.

Yield variations

Heavy fluctuations in the trends of coconut yield were noted especially in Central Luzon and Western Visayas (Fig. 11.6). The regions falling under high yielding group were Southern and Western Mindanao, Northern and Eastern Mindanao and Southern Tagalog; medium yielding group were Western Visayas, Eastern Visayas and Central Luzon, and low yielding group, Ilocos, Cagayan Valley and Bicol.

All regions exhibited upward trends in yield during the first four years. The yield in Ilocos, Cagayan Valley and in the two Visayas regions also had increasing trends during the next four years while the rest of the regions had declining yields. During the rest of the period, all regions had declining trends in yield except Eastern Visayas and Southern and Western Mindanao which had increasing yield.

Effects of Regional Area Shifts on National Yield

Table 11.5 shows no significant effect of the changes in acreage distribution on the national yield of coconut. If the 1954/58 regional yields had remained the same, the national yield would have decreased very slightly between 1954/58 and 1969/72. On the

other hand, if the regional yields in earlier periods had been the same as that in 1969/72, the national yields during these periods would have been lower than the 1969/72 actual yield.

Between 1954/58 and 1969/72, the actual yield per hectare of coconut decreased from 5,515 to 3,751 nuts only. If acreage distribution had been constant the national yield would have decreased to 3,477 nuts per hectare only.

CHAPTER XII

SUGARCANE

Sugarcane is one of the Philippines' top exports. The annual value of sugar exports alone contributed about one-fourth of the total foreign exchange earnings of the country.[14] The inability of the country to fulfill both domestic requirements and U.S. commitments is at present a great problem of the industry. This problem resulted from a growing demand, currently increasing more rapidly than supply.

As a whole the output growth of the sugar industry had been primarily due to area expansion rather than to productivity increase per unit area, although an inverse relationship was even evident.[15]

Shifts of production in the Western Visayas region had pronounced effect on the national output because two-thirds of the total area planted to sugarcane are in the Western Visayas. In addition, this region had the highest productivity per unit area among all sugar-producing regions in the Philippines.[16]

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[14] "The Evening News" The Sugar Industry Supplement. January 1964.

[15] Prantilla, E.D. The Supply Response of Sugar in the Philippines. Unpublished Master's Thesis, U.P. at Los Banos, 1968.

[16] Ibid.

Table 12.1. Growth rates and periodical changes in sugarcane production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72		Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72		Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65:1954/57	1962/65:1969/72:1969/72	
	per cent											
Philippines	2.5	37.3	16.3	59.8	2.7	12.5	40.4	58.0	-0.2	22.1	-17.1	1.2
Ilocos	-10.4	-70.6	-53.9	-86.4	-11.3	-76.3	-56.6	-89.7	1.0	23.4	6.6	31.5
C. Valley	6.3	332.8	-34.4	183.8	2.4	77.5	-29.9	24.4	3.9	143.3	-6.5	127.6
C. Luzon	1.5	40.6	-92.3	-89.2	1.1	11.2	11.4	24.0	0.4	26.5	-93.1	-91.3
S. Tagalog	3.3	25.2	-38.3	73.2	2.6	6.6	48.9	58.7	0.7	17.5	-7.1	9.1
Bicol	9.4	224.0	41.4	358.2	4.0	25.7	19.7	50.4	5.3	159.2	17.8	205.3
E. Visayas	6.3	88.1	59.0	199.1	6.2	95.1	50.6	194.0	0.1	-3.7	5.5	1.6
W. Visayas	2.4	36.7	21.8	66.4	3.2	15.7	50.4	74.0	-0.8	18.0	-19.0	-4.4
NE Mindanao	-2.8	-50.0	-32.9	-66.5	-2.2	-70.0	38.8	-58.3	-0.6	66.9	-51.5	-19.0
SW Mindanao	3.3	-71.2	112.7	-38.7	-6.1	-84.4	7.0	-83.3	10.0	85.5	98.5	268.3

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

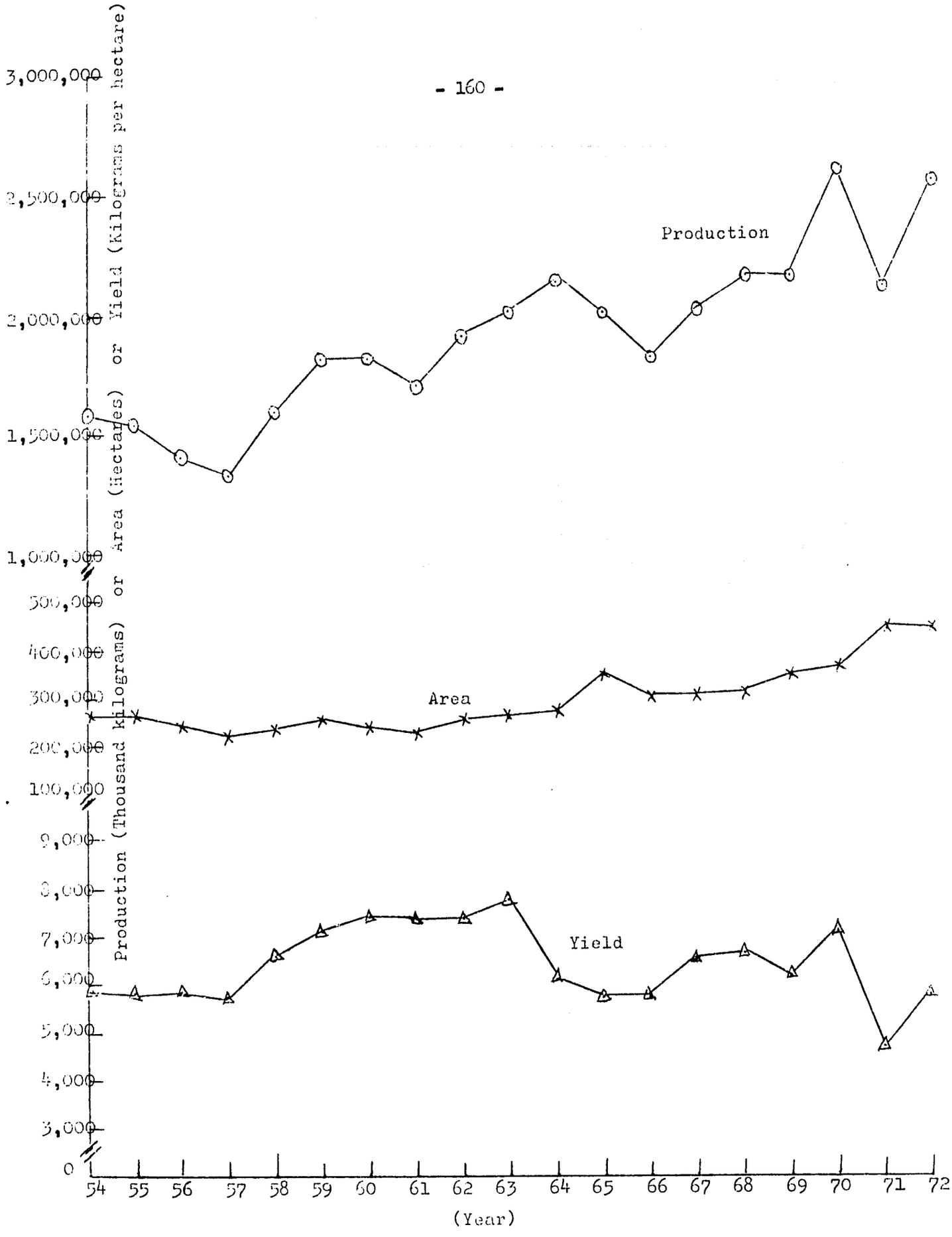

Fig. 12.1. Long-term trends in sugarcane production, area and yield, Philippines, 1954-1972

Table 12.2. Relative influence of area and yield on sugarcane production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
1954/57 to 1962/65					
Philippines	37.3	37.1	62.8	.1	100
Ilocos	-70.6	117.5	-17.2	-.3	100
C. Valley	332.8	30.2	69.7	.1	100
C. Luzon	40.6	31.2	68.9	-.1	100
S. Tagalog	25.2	28.4	71.8	-.2	100
Bicol	224.0	19.4	80.6	-.2	100
E. Visayas	86.1	105.8	-5.9	.1	100
W. Visayas	36.7	46.7	52.9	.4	100
NE Mindanao	-50.0	173.4	-73.9	.5	100
SW Mindanao	-71.2	149.4	-49.7	.3	100
1962/65 to 1969/72					
Philippines	16.3	224.0	-123.7	-.3	100
Ilocos	-53.9	107.6	- 8.2	.6	100
C. Valley	-34.4	84.2	15.9	-.1	100
C. Luzon	-92.3	-4.2	104.4	-.2	100
S. Tagalog	-38.3	122.6	-22.8	.2	100
Bicol	41.4	51.9	47.2	.9	100
E. Visayas	59.0	88.3	11.6	.1	100
W. Visayas	21.8	207.0	-106.8	-.2	100
NE Mindanao	-32.9	-82.1	181.2	.9	100
SW Mindanao	112.7	9.0	90.9	.1	100
1954/57 to 1969/72					
Philippines	59.8	97.5	2.5	nil	100
Ilocos	-86.4	113.7	-13.7	nil	100
C. Valley	183.8	20.9	78.8	.3	100
C. Luzon	-89.2	- 9.7	109.7	nil	100
S. Tagalog	73.2	84.1	15.9	nil	100
Bicol	358.2	26.8	73.3	-.1	100
E. Visayas	199.1	98.4	1.5	.1	100
W. Visayas	66.4	108.7	-8.9	.2	100
NE Mindanao	-66.5	80.1	19.3	.6	100
SW Mindanao	-38.7	366.1	-266.5	.4	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year)-log of area (beginning year); and log P is log of production (ending year)-log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

National Changes in Sugarcane Production, Area and Yield

Production, area and yield may be divided into three periods of (1) mildly decreasing trends from 1954 to 1957, (2) moderately increasing trends from 1958 to 1963, and (3) generally increasing area and production but fluctuating and decreasing yield from 1964 to 1972 (Figure 12.1).

The first four years (1954 to 1957) under review experienced some negative changes in production from 1.6 to 1.3 million kilos, in area from 165.1 to 234.7 thousand hectares, and in yield from 5,996 to 5,777 kilos per hectare.

Table 12.1 shows that production, area and yield had positive changes of 37.3, 12.5 and 22.1 per cent, respectively from 1954/57 to 1962/65. The increase in production was attributed largely to increased yield accounting 62.[illegible] per cent of the change in production (Table 12.2). An increase in area in 1965 could not offset the decrease in yield, hence the decrease in production during the same year. A slightly increasing area was responsible for the increase in production for the ensuing years.

Production and area registered an annual growth rates of 2.5 and 2.7 per cent, respectively while yield showed an annual decrease of -0.2 per cent.

Regional Changes in Sugar Production, Area and Yield

Regional variations in production

All regions exhibited positive production changes between 1954/57 and 1962/65 except Ilocos and the two Mindanao regions (Table 12.1).

Table 12.3. Relative contribution of various regions to total sugarcane production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	0.2	0.1	16.9	10.0	0.1	3.1	69.0	0.1	0.5	100
1955	0.3	0.1	19.0	9.3	0.1	3.5	66.4	0.1	0.6	100
1956	0.3	0.1	19.5	9.3	0.1	3.5	66.4	0.1	0.7	100
1957	0.3	0.1	19.5	9.3	0.1	3.6	66.2	0.1	0.8	100
1958	0.3	0.1	19.3	9.0	0.2	4.6	65.6	0.1	0.8	100
1959	0.2	0.1	15.6	8.3	0.2	4.[illegible]	69.9	0.1	0.7	100
1960	0.2	0.1	20.0	7.9	0.2	4.0	67.1	0.1	0.4	100
1961	0.1	0.1	17.2	8.4	0.1	4.4	69.5	0.1	0.1	100
1962	0.1	0.1	17.1	9.0	0.1	4.7	68.7	0.1	0.1	100
1963	0.1	0.2	20.5	9.7	0.2	4.5	65.7	nil	0.1	100
1964	0.1	nil	17.4	8.4	0.3	5.9	67.7	nil	0.2	100
1965	0.1	0.4	19.5	8.5	0.3	4.0	66.5	0.1	0.2	100
1966	0.1	0.5	17.5	9.1	0.3	5.1	67.1	0.1	0.2	100
1967	0.1	0.2	16.7	9.1	0.3	6.4	67.0	nil	0.2	100
1968	nil	0.3	13.6	9.1	0.3	7.1	69.4	nil	0.2	100
1969	nil	0.1	14.2	9.1	0.3	7.1	69.[illegible]	nil	0.2	100
1970	nil	0.1	11.8	9.4	0.2	6.4	72.0	nil	0.1	100
1971	nil	0.1	10.9	11.0	0.2	6.2	71.5	nil	0.1	100
1972	nil	0.1	13.9	11.0	0.2	6.2	67.4	nil	0.6	100

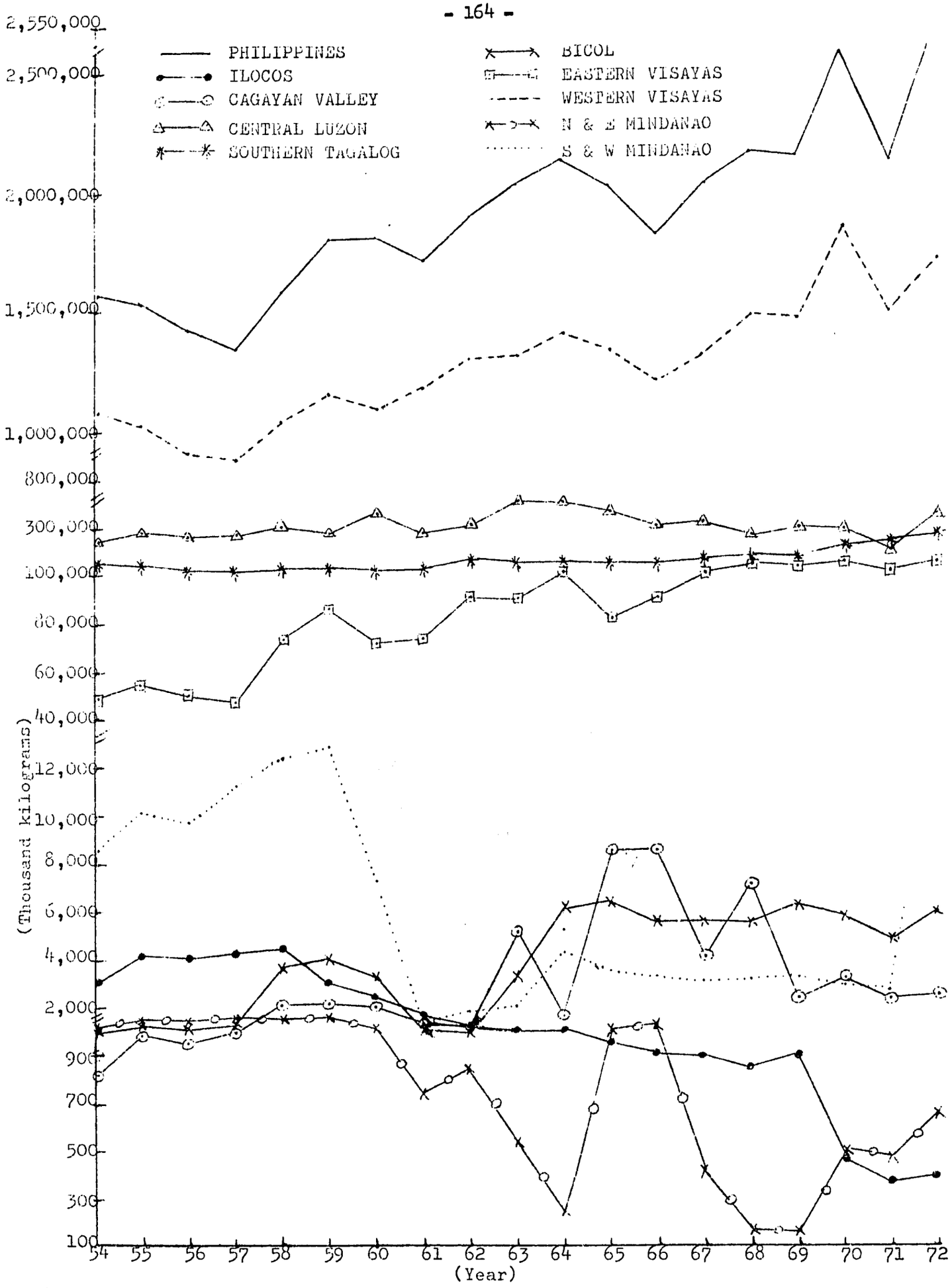

Fig. 12.2. Trends in sugarcane production by major Philippines, 1954-1972

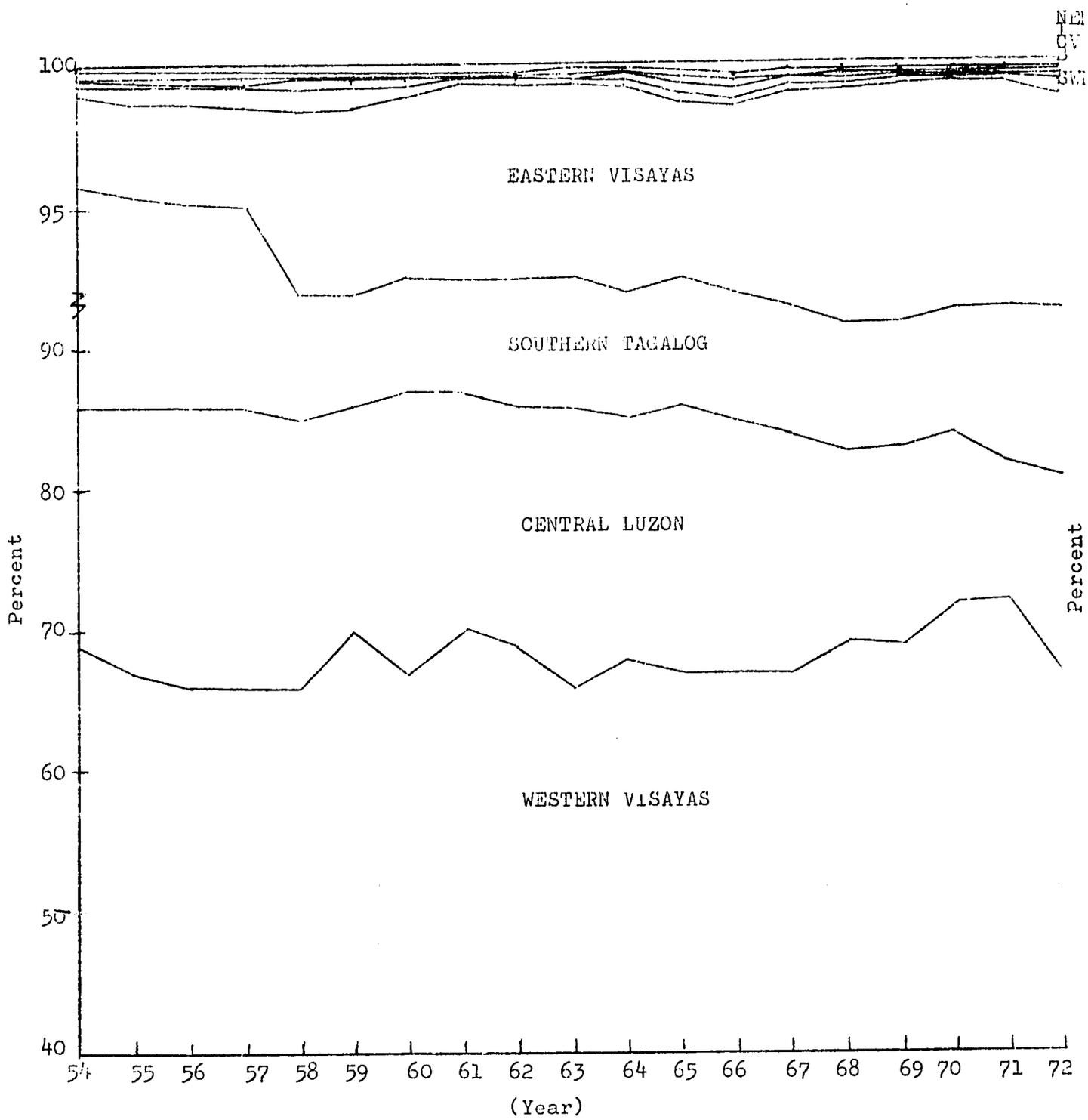

Fig. 12.3. Relative contribution of various regions to total sugarcane production, Philippines, 1954-1972

In contrast, only Bicol, the two Visayas regions and Southern and Western Mindanao showed positive changes between 1962/65 and 1969/72.

Changes in production from 1954/57 to 1962/65 were influenced more by yield than area in most regions. Between 1962/65 and 1969/72, however, area expansion influenced production changes more than yield. Likewise, for 1954/57 and 1969/72, area had a greater influence on changes in production in all regions except Cagayan Valley, Central Luzon and Bicol (Table 12.2).

Annual variations in production

Ilocos and Northern and Eastern Mindanao deviated from the generally increasing pattern of sugar production (Figure 12.2). Both showed distinctly decreasing production trends owing to declines in hectarage. The two regions together with Bicol and Cagayan Valley had the lowest sugarcane hectarage. On the other hand, the two Visayas regions exhibited the same production trend as that of the national level (Figure 12.2).

Western Visayas contributed approximately two-thirds of the total sugar production (Table 12.3). Productivity of this region, however, decreased annually by -0.8 percent. On the other hand, the increasing trends in both area and yield in Southern Tagalog resulted in a steady increase in production in the region.

Central Luzon ranked second in sugar production followed by Southern Tagalog and Eastern Visayas. For the rest of the regions, each had less than one percent relative contribution to total production.

Table 12.4. Relative contribution of various regions to total sugarcane area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	1.2	0.2	22.0	10.1	0.5	3.5	59.8	0.4	2.3	100
1955	1.4	0.3	23.1	10.2	0.7	3.7	57.5	0.4	2.7	100
1956	1.5	0.3	22.9	10.2	0.7	3.8	57.2	0.5	2.9	100
1957	1.6	0.4	22.8	10.1	0.8	3.8	56.9	0.5	3.1	100
1958	1.5	2.1	21.4	9.5	1.6	3.5	52.0	0.5	2.9	100
1959	1.3	2.1	20.6	9.5	1.5	3.8	52.9	0.4	2.9	100
1960	1.0	1.2	20.0	10.1	1.2	6.5	57.4	0.3	1.7	100
1961	0.7	1.2	21.6	10.4	0.6	6.3	58.7	0.2	0.3	100
1962	0.5	0.4	21.6	11.6	0.5	5.8	59.0	0.2	0.4	100
1963	0.3	0.6	22.0	10.0	0.3	5.4	60.3	0.1	0.4	100
1964	0.3	0.1	20.4	9.5	0.8	6.1	62.2	0.1	0.5	100
1965	0.2	0.7	24.9	8.0	0.7	7.8	57.3	0.1	0.3	100
1966	0.2	0.7	23.5	9.2	0.6	8.2	57.0	0.1	0.3	100
1967	0.2	0.7	22.8	9.0	0.8	7.4	58.7	0.1	0.3	100
1968	0.2	0.4	21.6	9.4	0.7	7.4	60.0	nil	0.3	100
1969	0.2	0.3	19.5	10.6	0.7	8.1	60.3	nil	0.3	100
1970	0.1	0.3	18.8	10.3	0.7	6.3	63.1	0.1	0.3	100
1971	0.1	0.2	17.1	10.2	0.4	6.6	65.1	0.1	0.2	100
1972	0.1	0.2	16.4	9.9	0.7	6.6	65.6	0.1	0.4	100

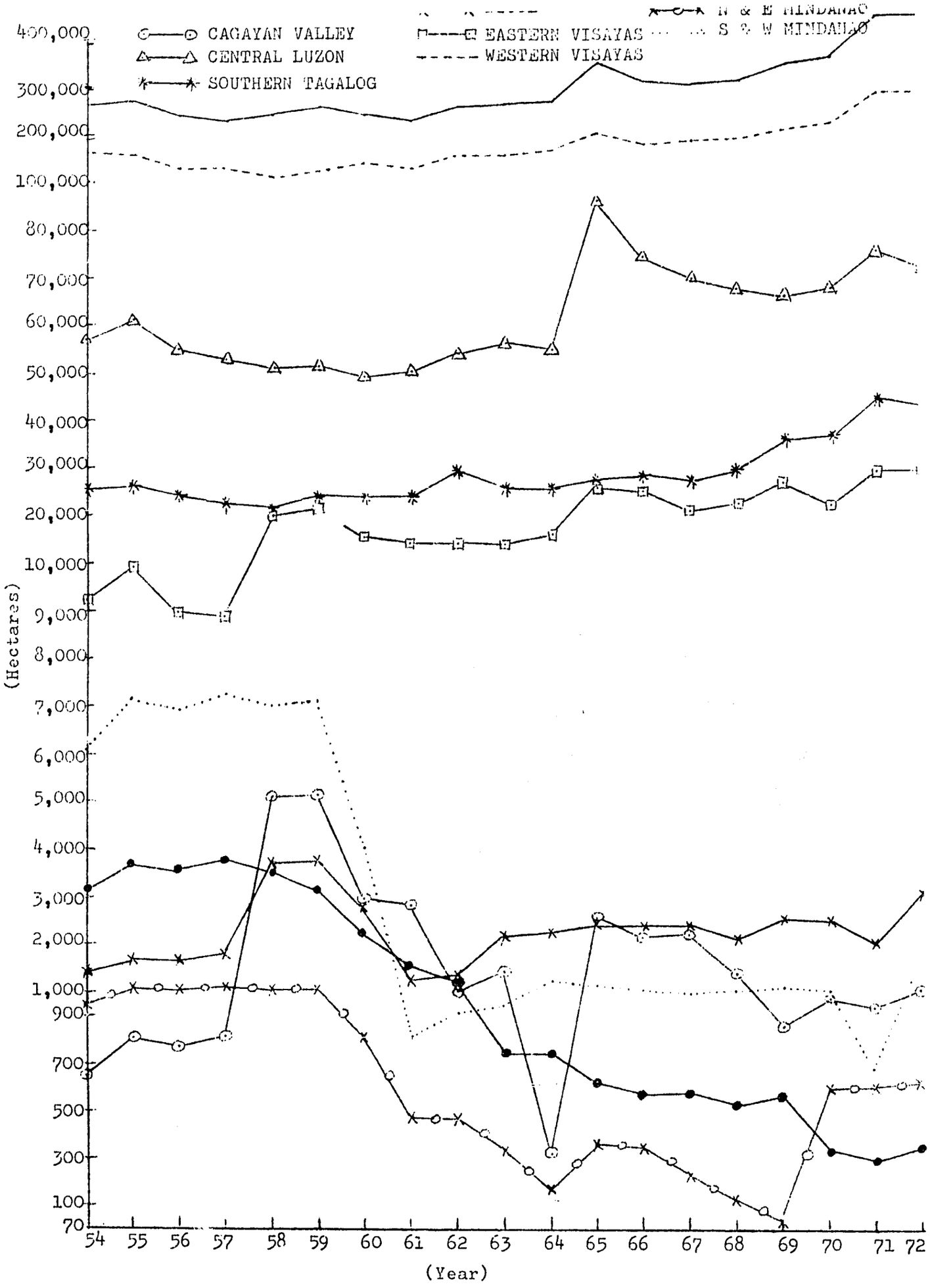

Fig. 12.4. Trends in sugarcane area in various regions, Philippines.

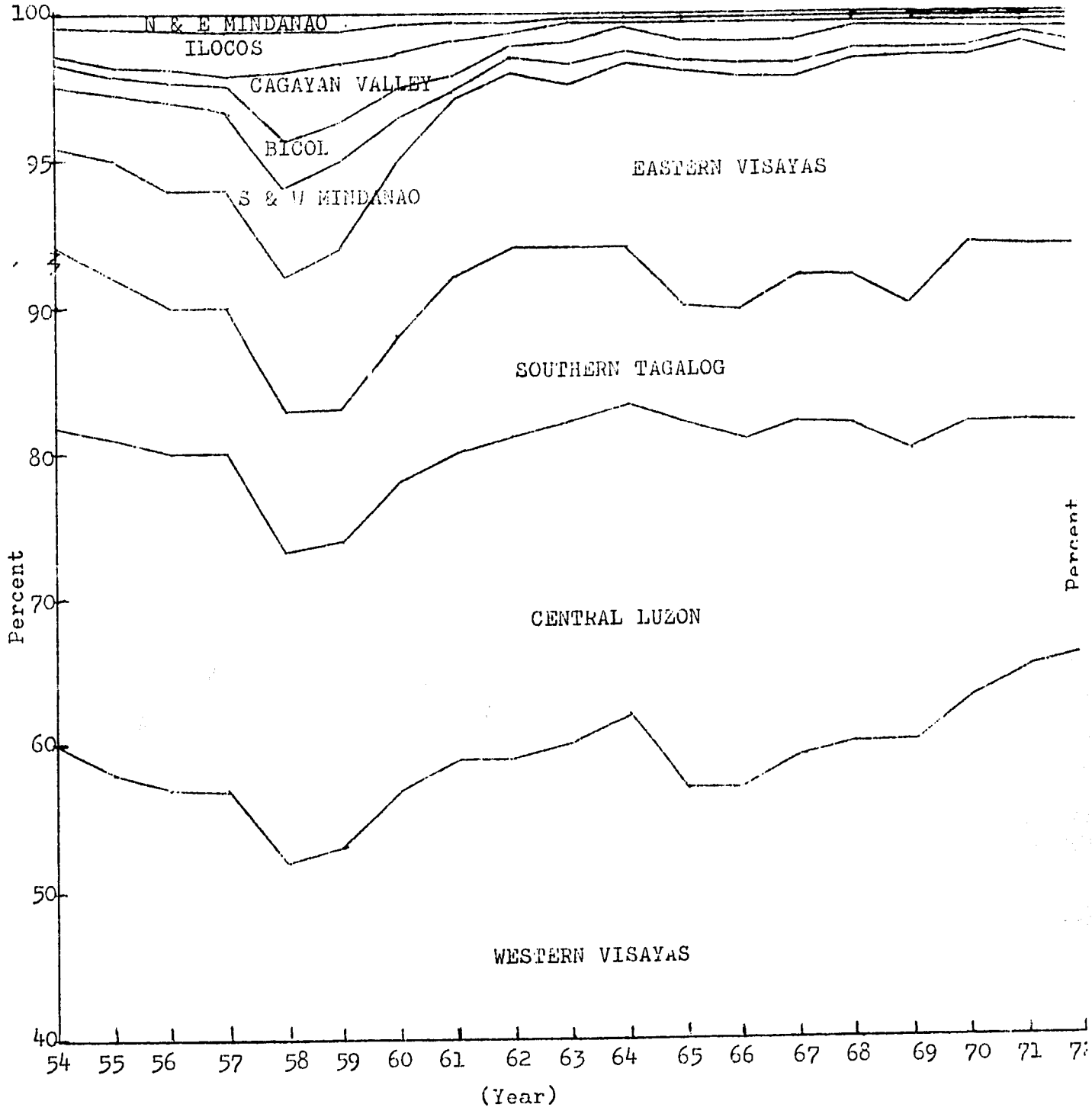

Fig. 12.5. Relative contribution of various regions to total sugarcane area, Philippines, 1954-1972

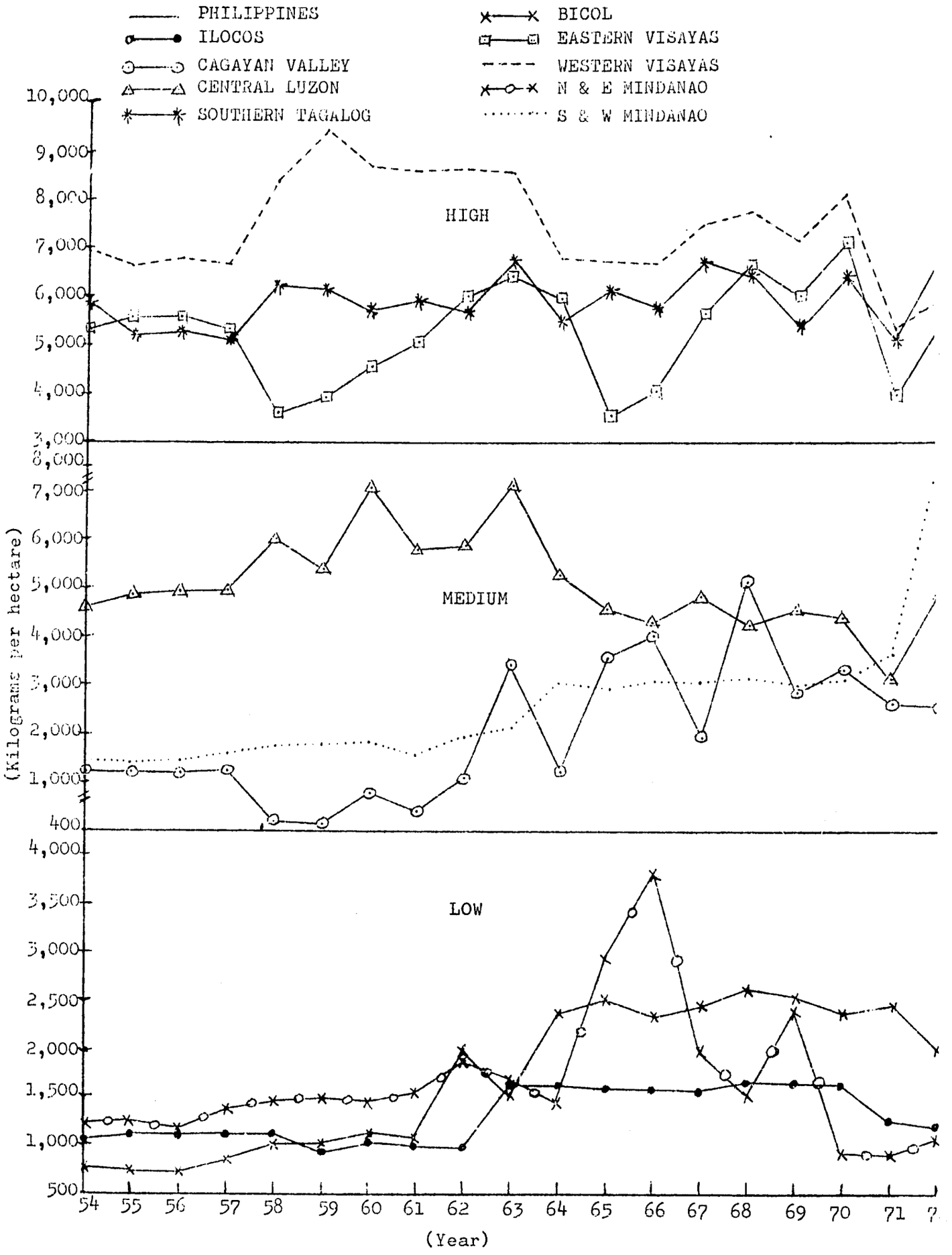

Fig. 12.6. Trends in sugarcane yields in various regions, Philippines.

Area variations

Figure 12.4 shows that hectarage of sugarcane in Western Visayas, Central Luzon, Southern Tagalog and Eastern Visayas had slightly increasing trends.

More than two-thirds of the total area planted to sugarcane were in Western Visayas (Table 12.3). Central Luzon, which ranked second to Western Visayas in sugar hectarage, had its highest relative contribution in 1965. The region's contribution to total sugar hectarage ranged from 16.4 to 24.9 per cent. Southern Tagalog ranked third in sugar hectarage and contributed 8 to 12 per cent of the total area during the 19-year period.

Yield variations

Western Visayas and Central Luzon, two of the top sugar-producing regions, showed fluctuating but generally declining trends in sugar yield (Figure 12.6). Southern Tagalog and the two Visayas regions were considered high yielding; Central Luzon, Cagayan Valley and Southern and Western Mindanao, medium yielding and the rest, low yielding regions.

Trends in yield of Bicol and Ilocos of the low yield group were slightly increasing while those of Cagayan Valley and Southern and Western Mindanao of the medium yield group were moderately increasing.

Table 12.5. Effects of regional area shifts on the national yield on sugarcane, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	6,009.6	6,095.8	6,196.4	6,326.9
1959/63	7,374.0	7,464.5	7,598.6	7,751.4
1964/68	6,103.7	6,179.8	6,234.2	6,385.1
1969/72	5,698.3	5,750.6	5,788.9	5,920.8
	yield index (1954/58 = 100)			
1954/58	100.0	101.4	103.1	105.3
1959/63	122.7	124.2	126.4	129.0
1964/68	101.6	102.8	103.7	106.3
1969/72	94.8	95.7	96.3	98.5

Effects of Regional Area Shifts on National Yield

The national average yield of sugarcane in 1954/58 was 6,010 kilos per hectare. If regional yield in 1954/58 had remained constant, the regional area shifts from 1954/58 to 1969/72 would have increased the national average yield to 6,327 kilos per hectare. The increase of 317 kilos per hectare or 5.3 per cent would have resulted from the change in the distribution of sugarcane hecturage among the nine regions. With 1954/58 as the base period, national yield index increased by 24.8 and 3.7 per cent in 1959/63 and 1964/68, respectively and decreased by -1.5 per cent in 1969/72. This result indicates that sugarcane productivity improved tremendously during the early 60's but declined during the last four years. The decline in national productivity was due to the decrease in yield of Western Visayas and Central Luzon, the top two sugar-producing regions.

CHAPTER XII

ABACA

The Philippines contributed more than 90 per cent of the total world abaca supply until the second world war. As such, the country holds practically a monopoly of abaca supply. Also, abaca had been one of the top ten traditional export dollar earners of the country until the 60's when it started to lag behind other primary export products owing to the unloading of U.S. Government huge stockpile of abaca for commercial usage and to combined competition of synthetic or man-made fibers as well as cheaper natural hard finers, like cisal and henequen. As a result, abaca hectarage decreased because producers swithced to other industries and converted part of their plantation to more profitable crops.[17/]

Lately, domestic fibercraft industry bloomed and due to the oil shortage and threat of pollution, price of synthetic fibers started to increase, bringing a favorable demand trend for abaca fiber.

National changes on abaca production, area and yield

Between 1954/57 and 1969/72, the yield of abaca had an average increase of 54.4 per cent while area and yield had average decreases

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[17/] Report on Abaca Industry. Prepared by the Ad-Hoc Inter-Agency Committee on the Rationalization of the Abaca Industry as per NEDA Resolution No. 175 1973. February, 1974.

Table 13.1. Growth rates and periodical changes in abaca production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57:1969/72
	per cent											
Philippines	0.2	11.5	-13.5	-3.6	-2.5	-14.3	-16.3	-28.3	2.8	30.0	3.2	54.4
S. Tagalog	-0.7	-24.7	146.4	84.6	-13.3	-62.9	193.0	8.6	12.1	103.1	-15.9	70.8
Bicol	1.2	6.9	11.3	19.0	-1.7	-5.7	-8.5	-13.7	3.0	13.4	21.6	37.9
E. Visayas	5.7	163.9	-4.1	153.1	4.1	122.4	-2.3	117.4	1.8	18.6	1.9	16.4
W. Visayas	10.0	172.1	35.5	268.4	3.1	159.8	-4.6	149.2	6.7	4.8	41.1	47.8
NE Mindanao	1.7	24.1	-5.1	17.8	-0.9	-3.6	-10.4	-13.7	2.6	28.8	6.0	36.4
SW Mindanao	-5.1	-24.9	-46.6	-59.9	-9.0	-53.4	-45.7	-74.7	4.3	61.1	1.7	58.4

a/ Ilocos, Cagayan Valley and Central Luzon are not included in the analysis.

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_o = index of production, area or yield in 1972
A_t = index of production, area or yield in 1954

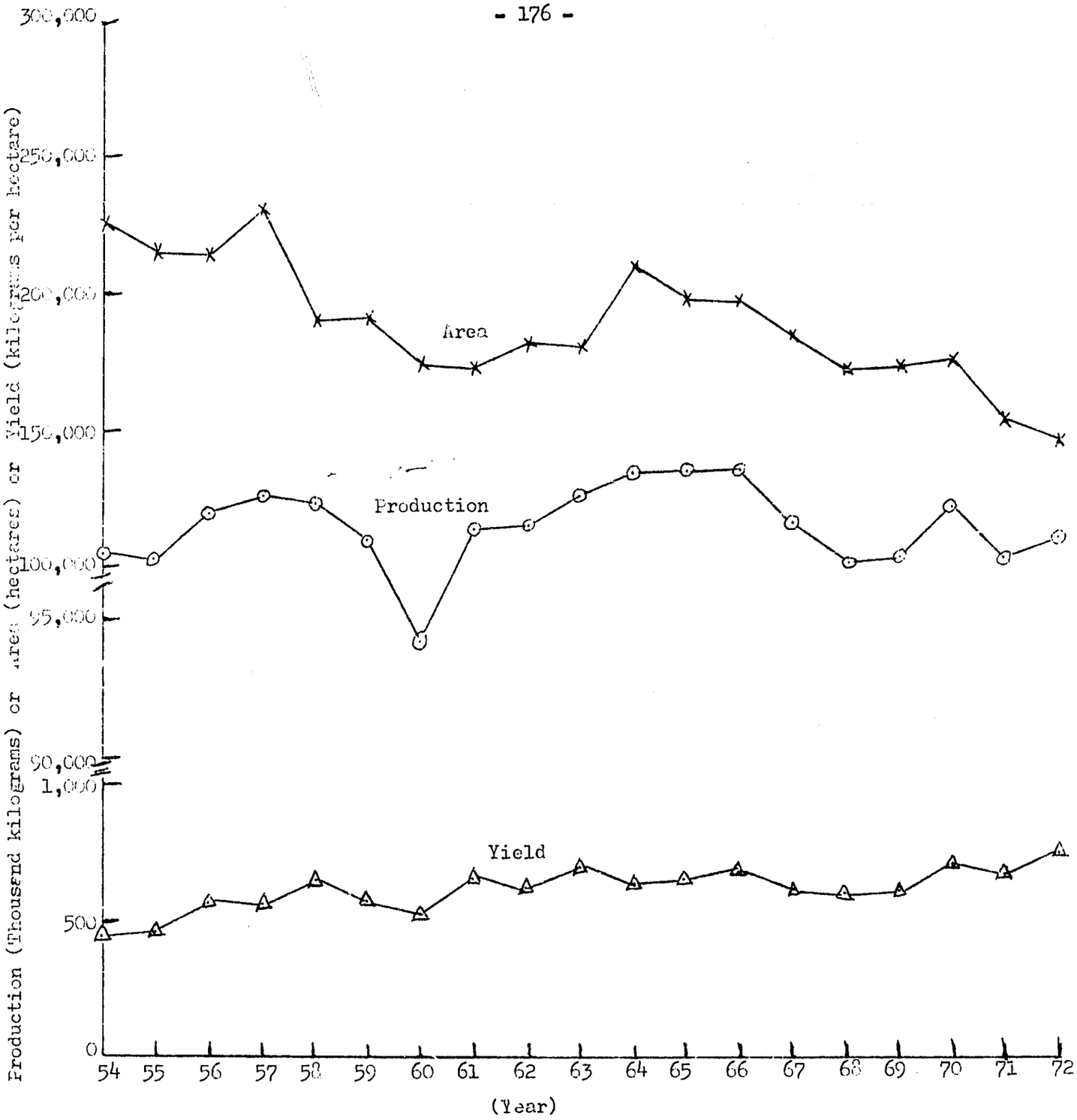

Fig. 13.1. Long-term trends in abaca production, area and yield, Philippines, 1954-1972

of -28.3 and -3.6 per cent, respectively (Table 13.1). During the 19-year period, yield increased annually at the rate of 2.8 per cent but area receeded at an equally fast rate of 2.5 per cent annually.

The positive change in national abaca production during the first period (1954/57 to 1962/65) was due to the increase in yield while the decrease in production during the second period (1962/65 to 1969/72) was brought about by the decrease in area.

From 1954 to 1972, movements in area and production were fluctuating but generally decreasing. In contrast, the trend in yield was slightly increasing (Figure 13.1). Marginal abaca plantations were probably converted to other uses and the more productive ones remain, hence the generally increasing yield at the national level.

Regional Changes in Abaca Production, Area and Yield

Regional variations in production

Between 1954/57 and 1962/65, Southern Tagalog and Southern and Western Mindanao showed abaca production decreases of about 25 per cent owing to more than 50 per cent hectarage declines in these regions. On the other hand, Eastern Visayas and the two Mindanao regions had negative changes in production from 1962/65 to 1969/72 brought about also by changes in area.

Table 13.2 shows that area had a greater influence on production changes than yield in four of the six regions included

Table 13.2. Relative influence of area and yield on abaca production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
1954/57 to 1962/65					
Philippines	11.5	-142.1	242.1	nil	100
Ilocos	-	-	-	-	-
C. Valley	-	-	-	-	
C. Luzon	-	-	-	-	-
S. Tagalog	-24.7	349.8	-249.8	nil	100
Bicol	6.9	-88.5	188.5	nil	100
E. Visayas	163.9	82.4	17.6	nil	100
W. Visayas	172.1	95.4	4.6	nil	100
NE Mindanao	24.1	- 16.9	116.9	nil	100
SW Mindanao	-24.9	266.9	-166.9	nil	100
1962/65 to 1969/72					
Philippines	-13.5	121.9	-21.9	nil	100
Ilocos	-	-	-	-	-
C. Valley	-	-	-	-	-
C. Luzon	-	-	-	-	-
S. Tagalog	146.3	119.2	-19.2	nil	-
Bicol	11.3	-82.5	182.5	nil	100
E. Visayas	-4.1	54.9	45.1	nil	100
W. Visayas	35.5	-13.8	113.8	nil	100
NE Mindanao	- 5.1	211.0	-111.0	nil	100
SE Mindanao	-46.0	97.3	2.7	nil	100
1954/57 to 1969/72					
Philippines	-3.6	906.1	-806.1	nil	100
Ilocos	-	-	-	-	-
C. Valley	-	-	-	-	-
C. Luzon	-	-	-	-	-
S. Tagalog	84.6	13.4	86.6	nil	100
Bicol	19.0	-84.8	184.8	nil	100
E. Visayas	153.1	83.6	16.4	nil	100
W. Visayas	268.4	70.0	30.0	nil	100
NE Mindanao	17.8	-89.6	189.6	nil	100
SW Mindanao	-59.9	150.4	-51.1	.7	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log of area (ending year)-log of area (beginning Year); and log P is log of production (ending year)-log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

Table 13.3. Relative contribution of various regions to total abaca production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	-	-	-	.1	27.3	10.8	.6	12.2	49.0	100
1955	-	-	-	.1	27.3	10.8	.6	12.2	49.0	100
1956	-	-	-	.1	27.6	10.9	.5	12.4	48.5	100
1957	-	-	-	.1	27.6	10.9	.5	12.4	48.5	100
1958	-	-	-	-	31.1	19.5	.6	16.5	32.3	100
1959	-	-	-	-	31.1	19.5	.6	16.5	32.3	100
1960	-	-	-	.1	28.8	21.5	1.4	13.4	34.8	100
1961	-	-	-	.1	26.1	25.8	1.3	11.3	35.4	100
1962	-	-	-	.1	17.6	30.6	2.1	12.8	36.8	100
1963	-	-	-	.1	29.5	22.2	1.3	10.8	36.1	100
1964	-	-	-	-	26.3	29.9	1.0	15.0	27.8	100
1965	-	-	-	-	30.8	20.8	1.1	16.0	31.3	100
1966	-	-	-	-	31.4	14.7	1.3	15.0	37.6	100
1967	-	-	-	.1	33.5	21.7	1.6	15.1	28.0	100
1968	-	-	-	.4	34.1	25.1	2.0	16.4	22.0	100
1969	-	-	-	.3	33.8	24.0	2.0	16.5	23.4	100
1970	-	-	-	.1	37.0	27.2	1.5	14.2	20.0	100
1971	-	-	-	-	31.1	33.6	1.7	13.3	20.3	100
1972	-	-	-	.1	33.3	29.7	3.2	16.2	17.5	100

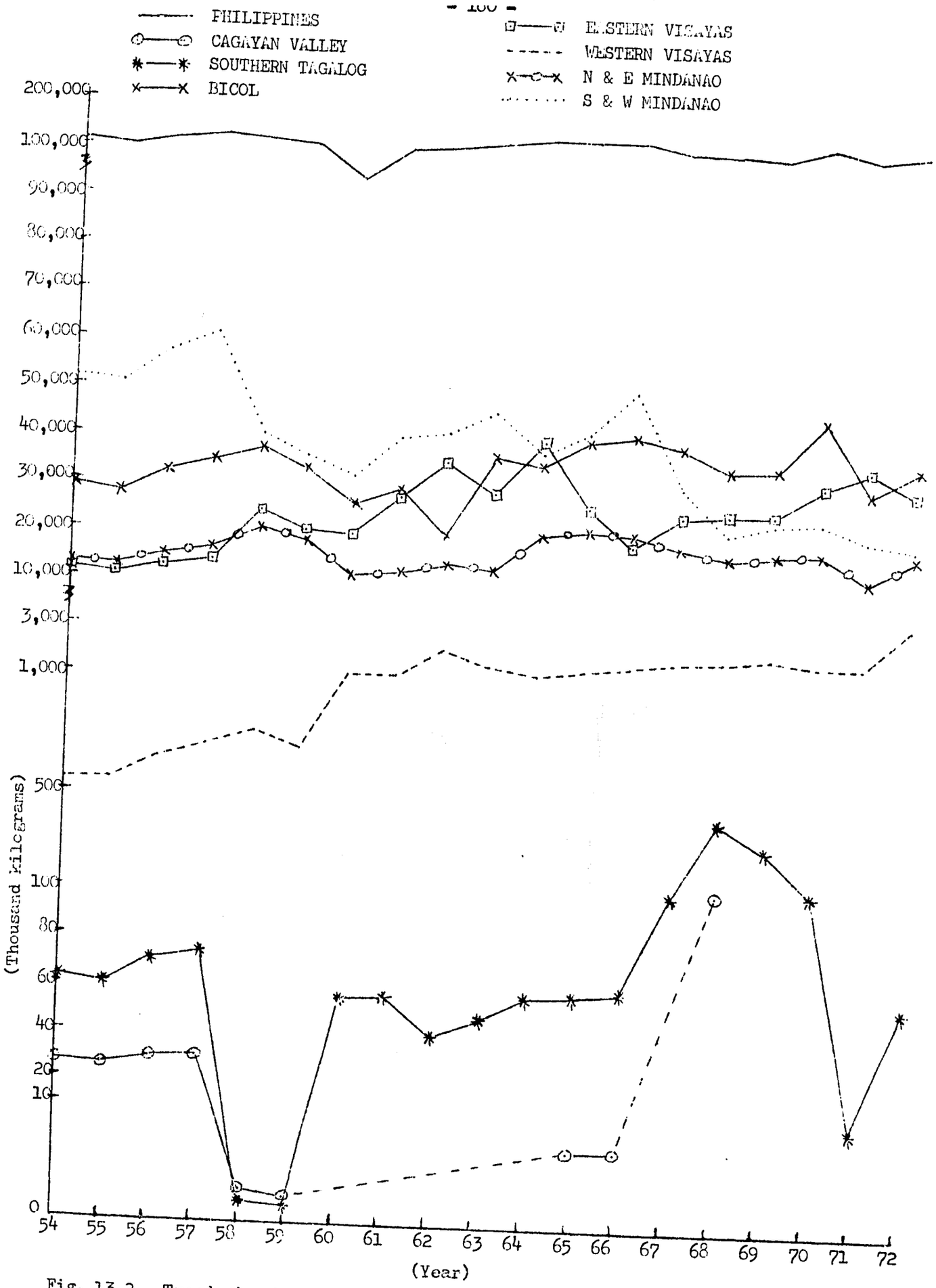

Fig. 13.2. Trends in abaca production by region, Philippines, 1954-1972

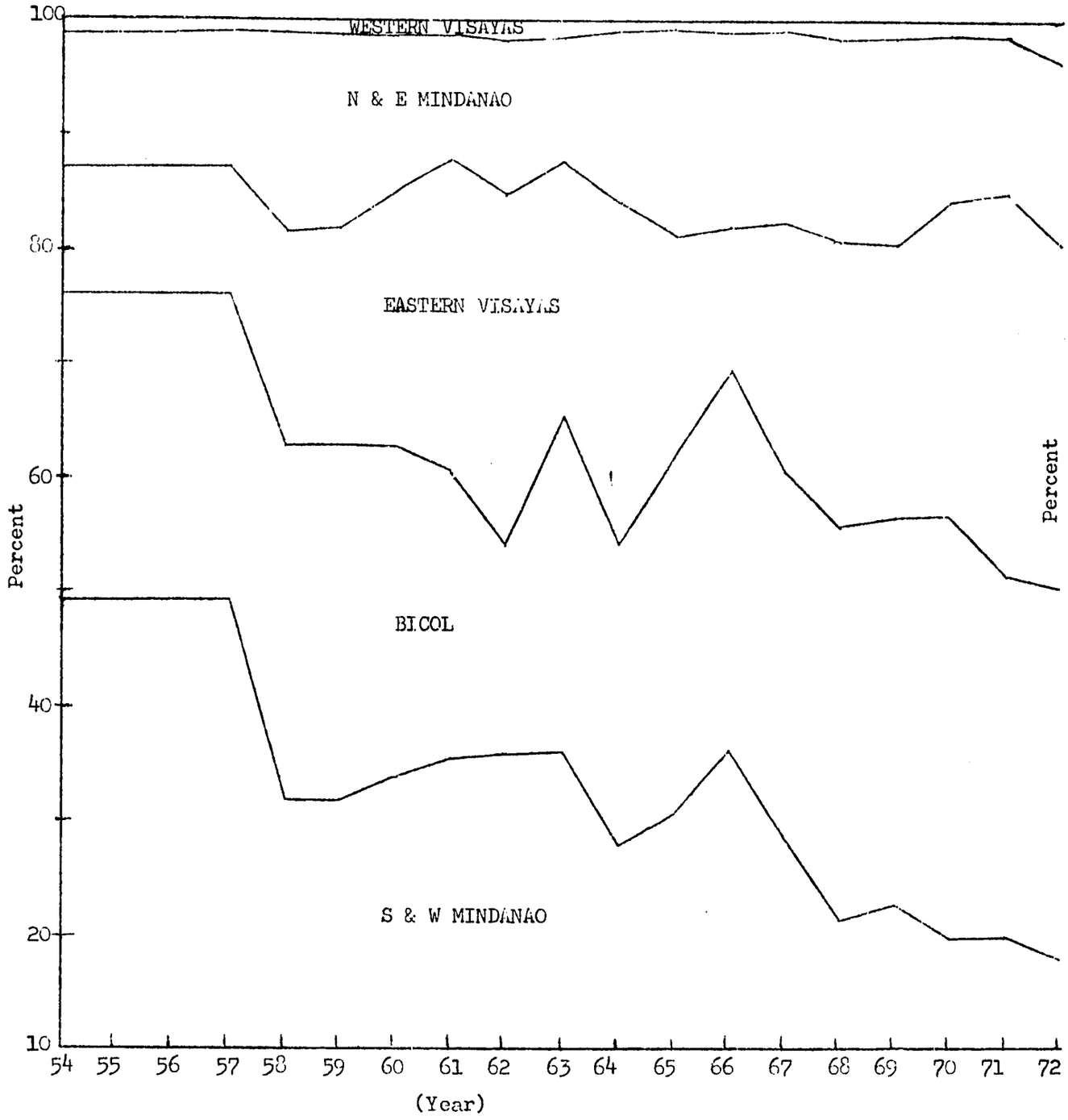

Fig. 13.3. Relative contribution of various regions to total abaca production, 1954-1972

in the analysis. Changes in production in Northern and Eastern Mindanao and Bicol during the first period (1954/57 to 1962/65) and Western Visayas and also Bicol during the second period (1962/65 to 1969/72) were due more to changes in yield than in area.

Annual variations in production

From 1954 to 1971, the relative contribution of Southern and Western Mindanao to total abaca production was the highest among the regions though at a decreasing trend from 49.0 per cent in 1954 to 17.5 per cent in 1972 (Table 13.3). Bicol ranked second with 10.8 to 29.7 per cent. These two regions had increased in relative contributions to total abaca production over the years.

Southern Tagalog and Southern and Western Mindanao deviated from the relatively stable national production pattern (Fig. 13.2). Both regions, especially the former, showed great fluctuations and decreasing trends in abaca production.

Area variations

All regions showed stable abaca hectarage during the first four years. Except for the two Visayas regions which exhibited a slightly increasing trends in area from 1959 to 1972, the rest showed declining trends (Figure 13.4). Southern and Western Mindanao, which contributed 46.1 to 12.5 per cent of the total abaca area from 1954 to 1957, had the greatest decline from 110 thousand hectares in 1954 to 18 thousand hectares only in 1972.

Table 13.4. Relative contribution of various regions to total abaca area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	-	-	-	.1	34.3	9.3	.8	9.4	46.1	100
1955	-	-	-	.1	34.3	9.3	.8	9.4	46.1	100
1956	-	-	-	.1	34.3	9.3	.8	9.4	46.1	100
1957	-	-	-	.1	34.3	9.3	.8	9.4	46.1	100
1958	-	-	-	-	42.7	10.1	.9	10.3	36.0	100
1959	-	-	-	-	42.4	9.9	1.5	12.7	33.1	100
1960	-	-	-	.1	42.1	10.8	2.1	12.1	32.8	100
1961	-	-	-	.1	40.1	20.6	1.8	10.6	26.8	100
1962	-	-	-	.1	32.3	27.5	3.5	10.0	26.6	100
1963	-	-	-	-	40.9	21.7	2.2	8.1	27.1	100
1964	-	-	-	-	37.4	27.8	1.9	10.6	22.3	100
1965	-	-	-	-	40.9	21.7	2.2	8.1	27.1	100
1966	-	-	-	.3	40.6	20.9	2.2	11.0	25.0	100
1967	-	-	-	.2	41.9	22.6	2.6	10.6	22.7	100
1968	-	-	-	.4	43.3	25.0	2.9	9.4	19.0	100
1969	-	-	-	.4	43.0	25.1	2.8	10.1	18.6	100
1970	-	-	-	.3	42.9	25.5	2.8	11.2	17.3	100
1971	-	-	-	-	38.7	30.9	3.1	11.4	15.9	100
1972	-	-	-	-	40.0	32.4	2.3	12.8	12.5	100

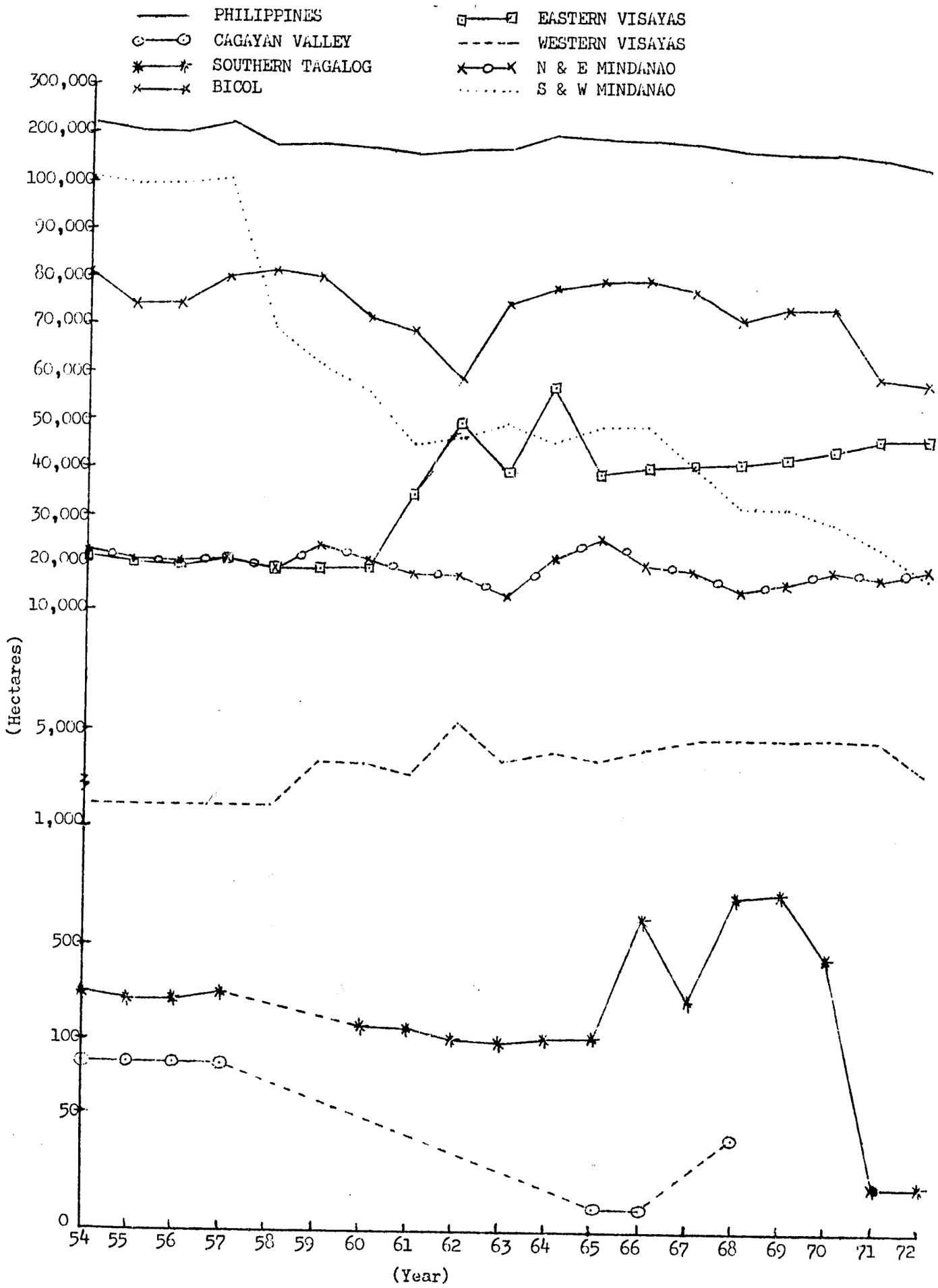

Fig. 13.4. Trends in abaca area by region, Philippines, 1954-1972

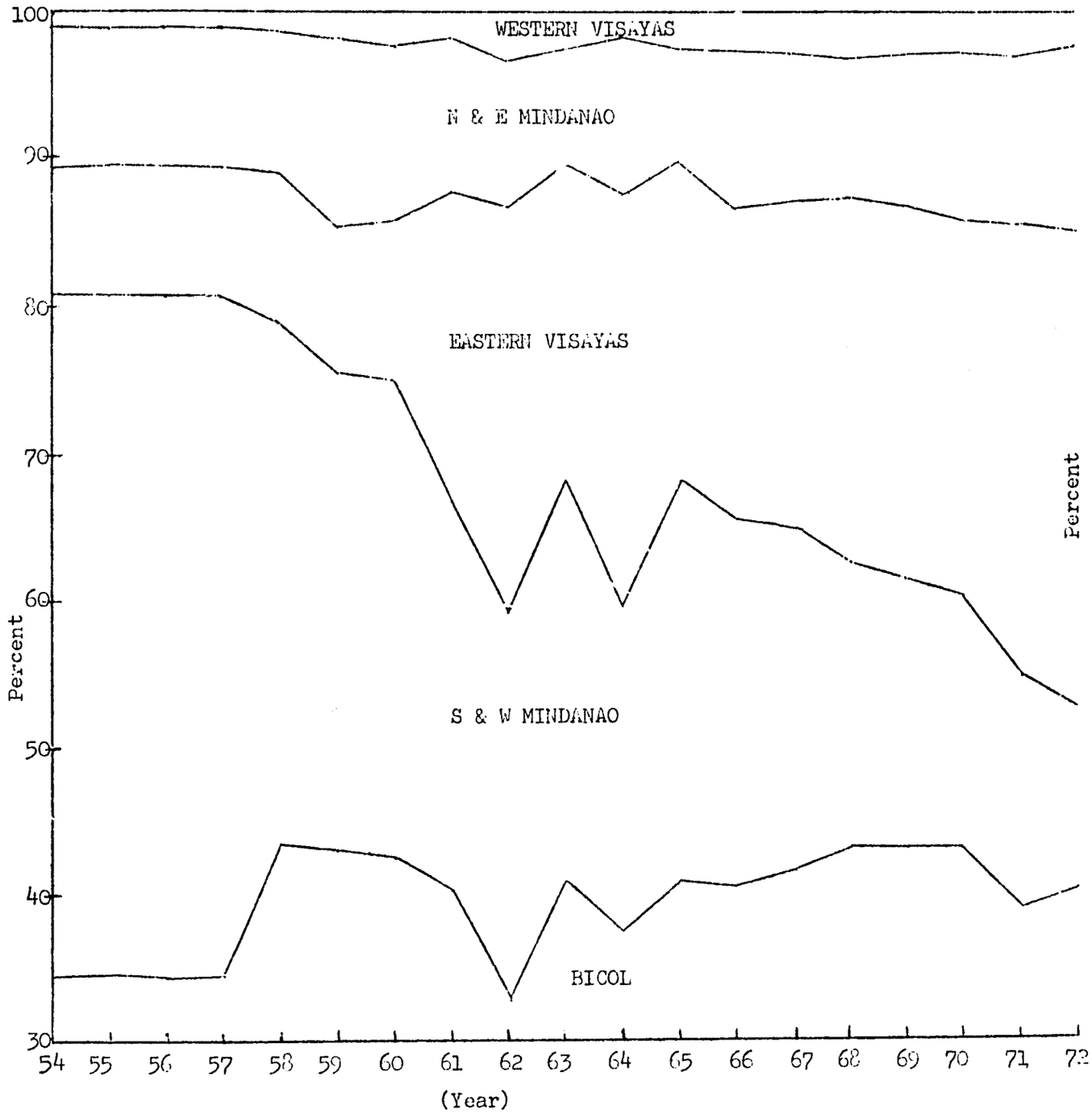

Fig. 13.5. Relative contribution of various regions to total abaca area, 1954-1972

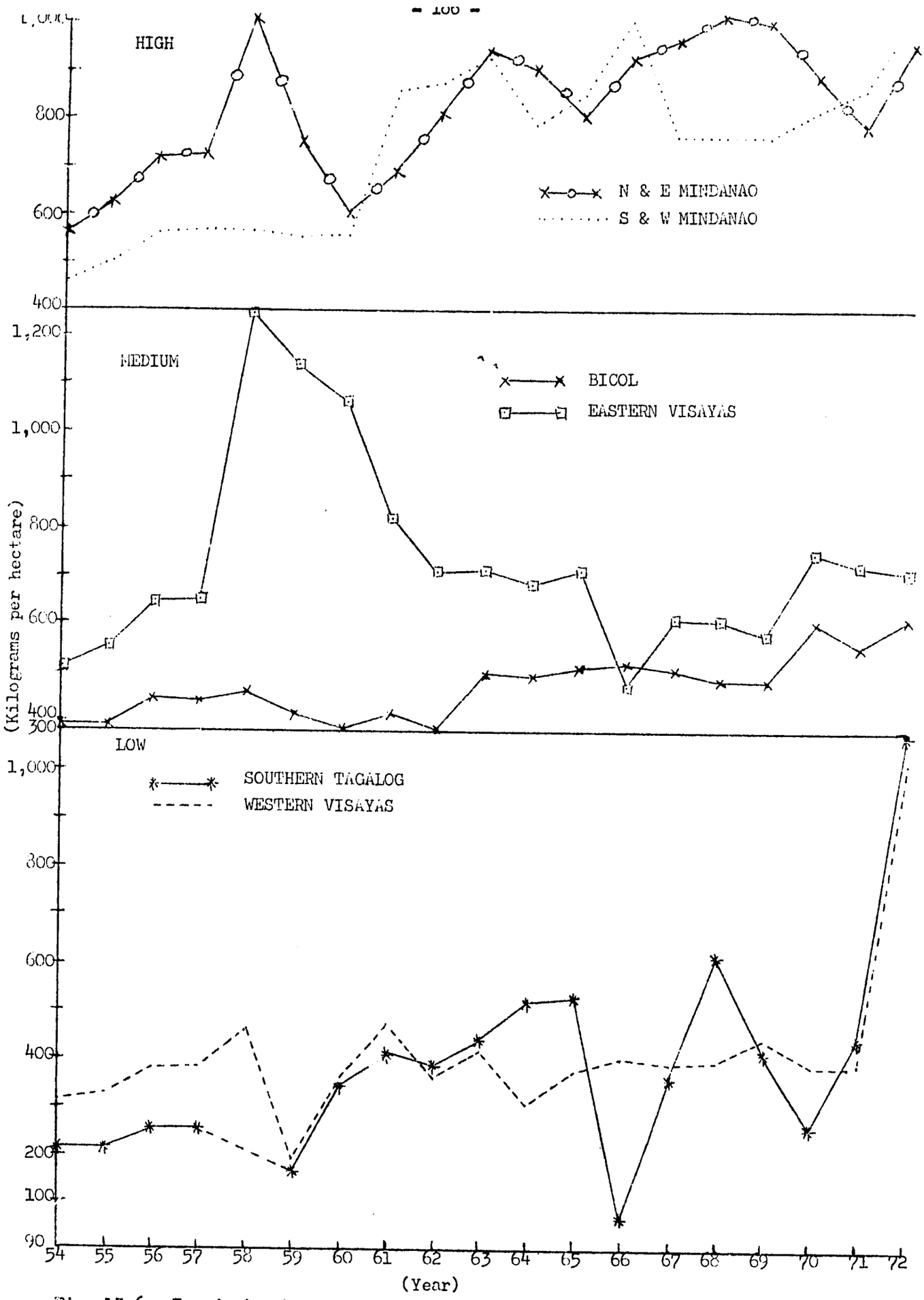

Fig. 13.6. Trends in abaca yield in various regions, Philippines, 1954-1972

The two Mindanao regions together with Bicol and Eastern Visayas contributed about 9 per cent of the total area devoted to abaca (Table 13.4). Between 1954 and 1972, the relative contribution of Bicol increased from 34.3 to 40.0 per cent while that of Southern Mindanao decreased from 46.1 to 12.5 per cent. Eastern Visayas also showed a sharp increase in relative contribution from 9.3 per cent in 1954 to 32.4 per cent in 1972.

Yield variations

The two Mindanao regions had the highest yield and increasing trend in productivity throughout the years under review (Fig. 13.6). Northern and Eastern Mindanao, however, had higher productivity than Southern and Western Mindanao in 1954 to 1960 and in 1967 to 1970.

Eastern Visayas had an increasing productivity during the first five years then declined evidently until 1966 when productivity again increased slightly in the succeeding years. Yield in Bicol, on the other hand, increased very mildly at the rate of 3.0 per cent yearly.

Southern Tagalog and Western Visayas had low and very irregular fluctuations in productivity. However, productivity of these two regions rose very distinctly in 1972.

Effects of Regional Area Shifts on National Yield

If the regional yields had remained constant between 1954/58 and 1969/72, the actual acreage distribution among regions would have resulted in a very slight increase in the national yield per hectare

Table 13.5. Effects or regional area shifts on the national yield of abaca, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	532.6	542.7	550.5	558.2
1959/63	633.4	622.7	623.4	623.4
1964/68	700.8	662.4	647.4	631.8
1969/72	734.9	706.2	694.6	683.1
	yield index (1954/58 = 100)			
1954/58	100.0	101.9	103.4	104.8
1959/63	118.9	116.9	117.0	117.0
1964/68	131.6	124.4	121.6	118.6
1969/72	138.0	132.6	130.4	128.3

from 533 to 558 kilograms (Table 13.5). On the other hand, if there had been no change in acreage distribution national yield would have increased to 735 kilograms or 132 per cent in 1969/72. The actual yield in 1969/72 was 683 kilograms or 28 per cent higher than in 1954/56.

CHAPTER XIV

TOBACCO

The tobacco industry has been contributing between ₱200 to ₱300 million annually to the government in the form of revenues from specific taxes, licenses and inspection fees. It is the main source of livelihood of about six million people and another 21,000 others in related industries that depend on the industry.

In 1973, tobacco production was valued at more than ₱175 million and ranked tenth among the major crops in cash receipts. Moreover, the tobacco industry earned more than $27 million in foreign earnings for the country during the same year.[10]

National changes in tobacco production, area and yield

Estimates of production, area and yield of tobacco in the Philippines can be characterized by (1) generally upward trends from 1955 to 1962, and (2) fluctuating but generally declining trends from 1962 to 1972 (Figure 14.1).

The trends in production, area and yield exhibited annual rates of growth of 3.6, 2.5 and 1.2 per cent, respectively (Table 14.1).

For the period 1954/57 to 1962/65, the increase in production (68.8%) resulted from increases in area (44.0%) and yield (17.2%).

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[10] Philippine Recommends for Tobacco, PCAR, 1972.

Table 14.1. Growth rates and periodical changes in tobacco production, area and yield by region, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	Average Changes 1962/65:1969/72	Average Changes 1954/57:1969/72
	per cent											
Philippines	3.8	68.8	-7.2	56.5	2.5	44.0	-10.7	28.6	1.2	17.2	3.8	21.7
Ilocos	7.7	40.7	-6.5	31.5	5.1	52.7	-15.3	29.2	2.4	-7.9	10.4	1.7
C. Valley	1.7	68.5	-4.9	66.2	1.4	25.1	.4	25.7	.2	34.7	-5.3	32.3
C. Luzon	3.8	66.3	-22.6	28.8	1.2	23.6	-33.6	-17.9	2.5	34.6	16.6	56.8
S. Tagalog	11.4	500.5	84.0	1004.9	6.4	227.2	54.2	404.4	4.7	83.6	19.4	119.1
Bicol	7.6	75.2	49.5	162.0	-4.1	-5.6	-31.2	-35.2	12.2	85.6	-17.8	504.3
E. Visayas	-2.1	36.4	-32.5	-8.0	1.1	48.3	-20.4	18.1	-3.2	-8.1	-15.3	-22.1
W. Visayas	-2.6	159.4	-44.9	42.9	-2.1	58.4	-31.4	8.6	-0.6	63.8	-19.7	31.7
NE Mindanao	5.0	356.4	-38.9	178.8	3.6	240.8	-36.8	115.5	1.3	33.9	-3.4	29.4
SW Mindanao	8.3	181.8	50.0	322.7	4.2	91.8	26.1	141.9	3.9	46.9	19.0	74.8

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

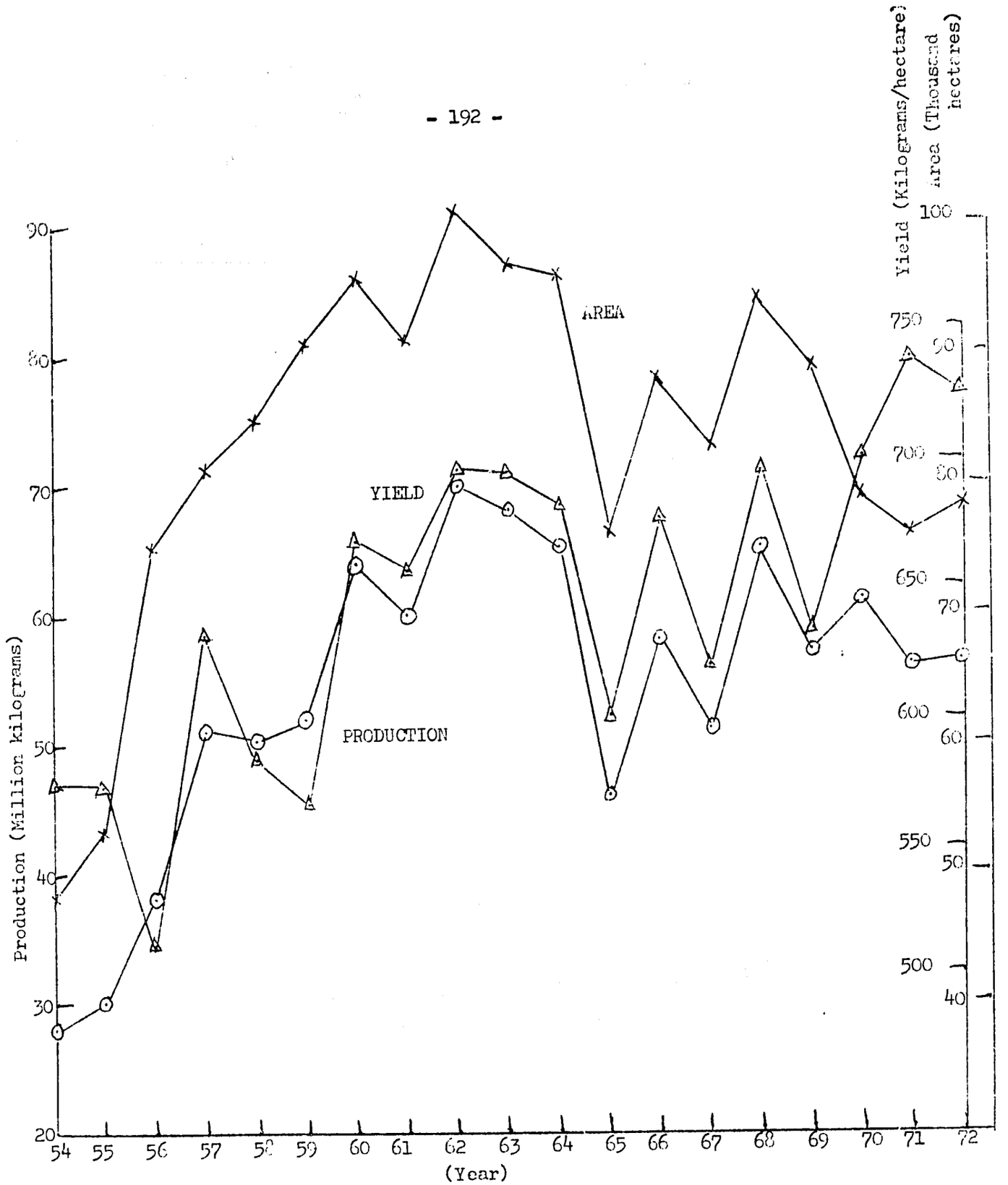

Fig. 14.1. Long-term trends in tobacco production, area and yield, Philippines, 1954-1972

Table 14.2. Relative influence of area and yield on tobacco production by year and by region, Philippines, 1954-1972

Year/Region	Change in Production	Change Because of Area a/	Yield b/	LI Term c/	Total
1954/57 to 1962/65					
Philippines	68.8	69.7	30.3	nil	100
Ilocos	40.7	124.0	-24.0	nil	100
C. Valley	68.5	43.0	57.7	-.7	100
C. Luzon	66.3	41.7	58.3	nil	100
S. Tagalog	500.5	66.1	33.9	nil	100
Bicol	75.2	-10.3	110.3	nil	100
E. Visayas	36.4	127.0	-27.0	nil	100
W. Visayas	159.4	48.2	51.8	nil	100
NE Mindanao	356.4	80.8	19.2	nil	100
SW Mindanao	151.8	62.3	37.7	-.6	100
1962/65 to 1969/72					
Philippines	-7.2	149.4	-49.4	nil	100
Ilocos	-6.5	246.6	-146.6	nil	100
C. Valley	-1.3	- 9.1	109.1	nil	100
C. Luzon	-7.2	159.9	-59.9	nil	100
S. Tagalog	83.4	71.0	29.0	nil	100
Bicol	49.5	-93.6	193.6	nil	100
E. Visayas	-32.6	57.9	42.1	nil	100
W. Visayas	-44.9	63.3	36.7	nil	100
NE Mindanao	-38.9	93.0	7.0	nil	100
SW Mindanao	50.0	57.2	42.8	nil	100
1954/57 to 1969/72					
Philippines	56.5	56.2	43.8	nil	100
Ilocos	31.5	93.7	6.3	nil	100
C. Valley	66.2	45.0	55.0	nil	100
C. Luzon	28.8	-78.0	178.0	nil	100
S. Tagalog	1004.9	67.4	32.6	nil	100
Bicol	162.0	-45.0	145.0	nil	100
E. Visayas	- 8.0	-198.8	298.8	nil	100
W. Visayas	42.9	23.0	77.1	-.1	100
NE Mindanao	178.8	74.9	25.1	nil	100
SW Mindanao	322.7	61.3	38.7	nil	100

a/ Computed by $\frac{\log X}{\log P} \times 100$ where: log X is log area (ending year)- log of area (beginning year); and log P is log of production (ending year)- log of production (beginning year).

b/ Computed as a/ but log of yield figure is used in place of log of area.

c/ Logarithmic interpolation term.

Likewise, increased production from 1954/57 to 1969/72 was due to increases in area (28.6 per cent) and yield (21.7 per cent). These are indications of the greater effect of area than yield on production changes (Table 14.2).

Regional changes in tobacco production, area and yield

Regional variations in production

Of the three periods considered, only the first period (1954/57 to 1962/65) shows an impressive increase in production for all regions. For the period 1954/57 to 1969/72, tobacco production increased in all regions except Eastern Visayas. The negative change in production in Eastern Visayas was due to the decrease in yield. On the other hand, production declined in all regions except Southern Tagalog, Bicol and Southern and Western Mindanao for the period 1962/65 to 1969/72, because of the negative changes in area.

Changes in production in most regions were influenced mainly by area rather than yield changes (Table 14.2).

Annual variations in production

Southern Tagalog region had the sharpest increase in production with an annual growth rate of 11.4 per cent from 1954 to 1972. Southern and Western Mindanao and Ilocos regions followed in close second and third with 8.3 and 7.7 per cent, respectively. However, Ilocos topped all the other regions with regard to tobacco production

Table 14.3. Relative contribution of various regions to total tobacco production, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	15.8	50.9	12.6	0.3	0.5	7.3	4.0	2.2	5.6	100
1955	37.4	36.5	10.4	0.2	0.4	5.2	3.9	1.4	4.6	100
1956	47.0	18.6	19.4	0.2	0.3	4.2	4.0	1.3	4.2	100
1957	53.1	15.2	19.4	0.2	0.3	3.4	3.7	1.0	3.7	100
1958	56.5	14.3	17.4	0.2	0.3	3.2	3.5	1.0	3.6	100
1959	49.4	15.7	20.0	0.2	0.[illegible]	4.0	3.3	2.2	4.4	100
1960	44.4	19.2	19.3	0.5	0.4	3.4	3.9	4.1	5.0	100
1961	37.3	22.4	19.1	0.6	0.3	3.7	6.0	4.0	4.0	100
1962	36.3	26.0	16.1	0.5	0.3	4.0	5.0	4.0	7.0	100
1963	34.7	27.3	16.6	0.7	0.3	3.6	5.4	4.4	7.0	100
1964	30.6	29.6	16.5	0.9	0.3	3.9	8.7	3.5	6.0	100
1965	37.4	25.1	14.5	1.2	0.9	3.6	5.7	2.8	8.0	100
1966	24.5	41.6	14.9	2.2	0.3	3.2	4.4	2.5	6.4	100
1967	27.3	26.[illegible]	23.4	3.2	0.3	3.6	4.9	3.0	7.5	100
1968	26.4	33.3	19.2	2.5	0.2	2.7	3.9	2.2	9.6	100
1969	31.8	26.6	17.6	2.4	0.3	2.9	4.4	2.5	12.1	100
1970	31.8	34.4	11.5	1.9	0.4	2.7	4.3	2.2	10.[illegible]	100
1971	30.7	33.3	12.6	0.8	0.7	3.0	4.5	2.6	11.8	100
1972	31.8	34.4	12.5	1.2	1.0	2.4	1.4	2.7	12.6	100

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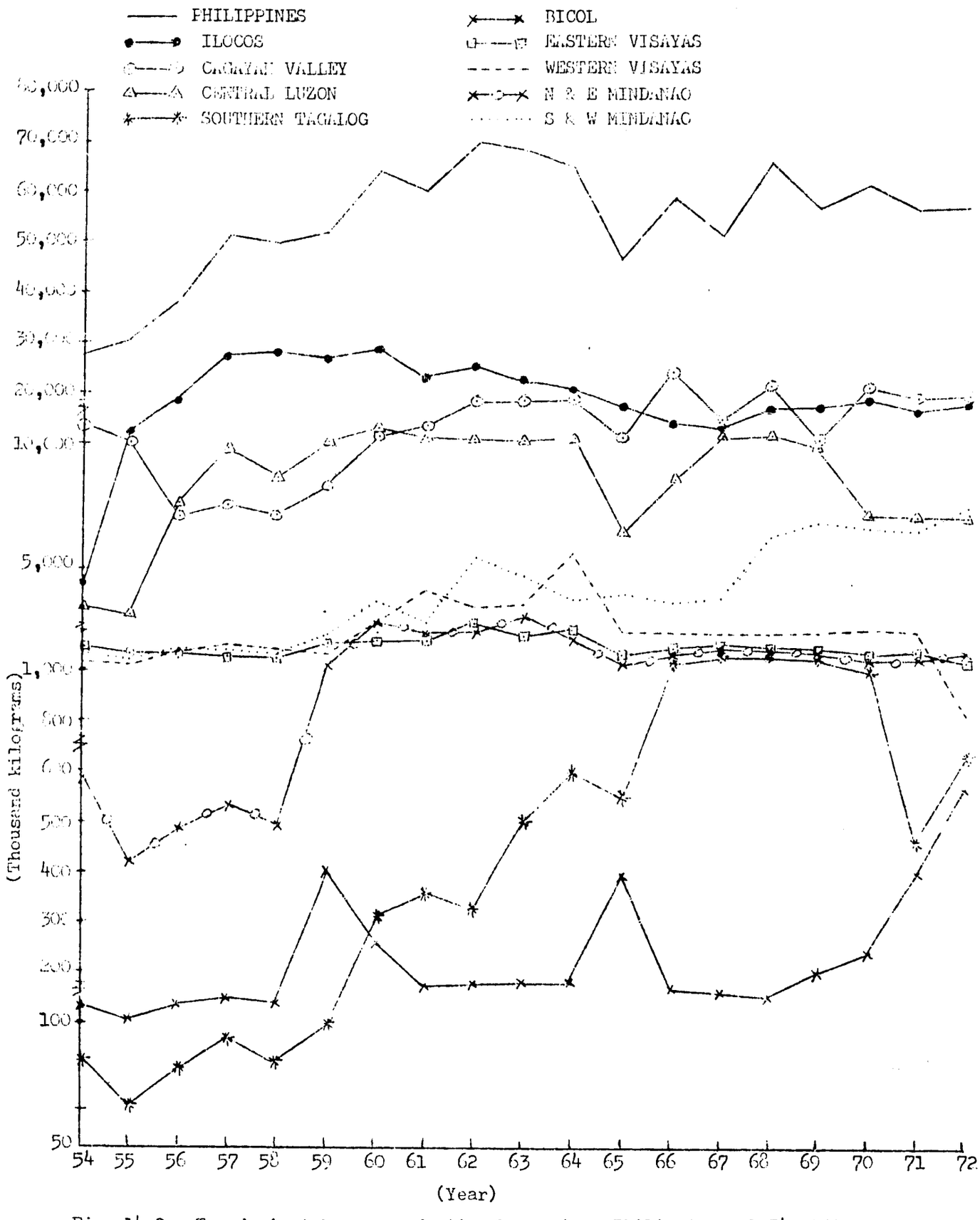

Fig. 14.2. Trends in tobacco production by region, Philippines, 1954-1972

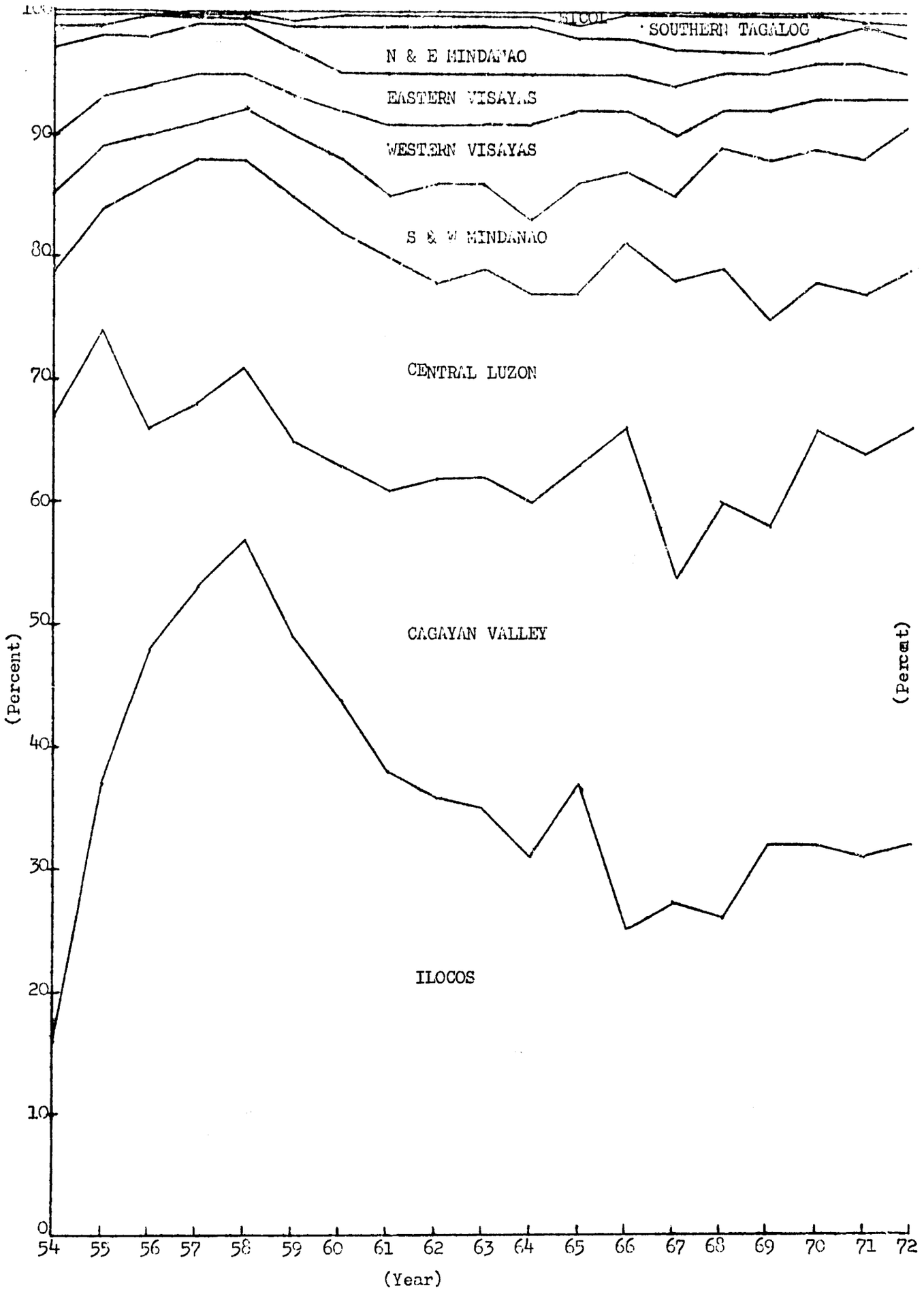

Fig. 14.3. Relative contribution of various regions to total tobacco production, Philippines, 1954-1972

from 1954 up to 1972. Southern Tagalog and Bicol were the least tobacco producers. The two Visayas regions and Northern and Eastern Mindanao showed relatively stable production patterns during the 19-year period (Figure 14.2).

Cagayan Valley was the biggest contributor to total production of tobacco in 1954 with as much as 5[illegible] per cent. The region's smallest contribution was 14.3 per cent of the total production in 1956. From 1959 onward, its contribution slowly increased but never equalled its initial percentage share (Table 14.3).

Ilocos replaced Cagayan Valley as the largest producer of tobacco from 1955 until 1965. Its relative contributions reached as high as 53.1 to 56.5 per cent in 1957 and 1956, respectively. However, the production trend during the succeeding years declined but the region maintained its top position except in 1966, 196[illegible] and 1970-72. Central Luzon which ranked third in production had relative contribution ranging from 11.5 to 23.4 per cent of the total tobacco production.

Area variations

The total area devoted to tobacco production followed a distinctly increasing trend until 1962. However, a slight downward movement was observed during the succeeding years (Figure 14.4).

From 1954/57 to 1962/65, only the Bicol region had a negative change in area of 5.6 per cent (Table 3.4). In contrast from 1962/65

Table 14.4. Relative contribution of various regions to total area, Philippines, 1954-1972

Year	Ilocos	Cagayan Valley	Central Luzon	Southern Tagalog	Bicol	Eastern Visayas	Western Visayas	NE Mindanao	SW Mindanao	Philippines
					per cent					
1954	21.0	42.9	14.2	0.5	1.1	5.9	5.1	2.2	6.3	100
1955	34.6	33.7	14.7	0.4	0.9	4.6	4.4	1.7	5.0	100
1956	40.7	25.0	20.2	0.4	0.6	4.2	4.0	1.3	3.6	100
1957	40.6	25.1	20.1	0.3	0.6	4.3	4.0	1.3	3.7	100
1958	49.7	20.2	18.1	0.3	0.5	3.4	3.5	1.0	3.3	100
1959	45.7	21.4	18.7	0.3	0.5	4.3	3.4	2.8	2.9	100
1960	46.3	21.3	17.3	0.6	0.4	4.4	3.2	4.0	2.5	100
1961	42.3	24.0	16.5	0.7	0.4	5.5	4.0	3.4	2.4	100
1962	41.7	24.7	15.3	0.6	0.3	5.2	3.9	4.2	4.1	100
1963	39.9	26.1	15.4	0.8	0.4	4.7	4.6	3.7	5.4	100
1964	33.6	28.3	15.5	0.9	0.4	4.9	5.9	3.8	6.2	100
1965	37.4	25.2	15.3	1.0	1.1	4.9	4.5	2.9	6.6	100
1966	28.5	36.6	13.7	1.9	0.4	4.3	3.7	2.6	8.4	100
1967	29.1	30.3	15.9	2.5	0.4	5.6	3.9	3.0	9.3	100
1968	30.5	34.3	15.7	2.2	0.3	3.9	3.6	2.3	7.2	100
1969	33.5	32.4	13.5	2.1	0.3	3.9	3.7	2.5	8.1	100
1970	33.2	33.4	10.9	1.9	0.5	4.4	4.5	2.6	8.6	100
1971	33.3	33.5	11.1	0.8	0.5	4.6	4.6	2.8	8.8	100
1972	34.7	35.0	11.1	0.8	0.3	4.5	2.1	2.8	8.7	100

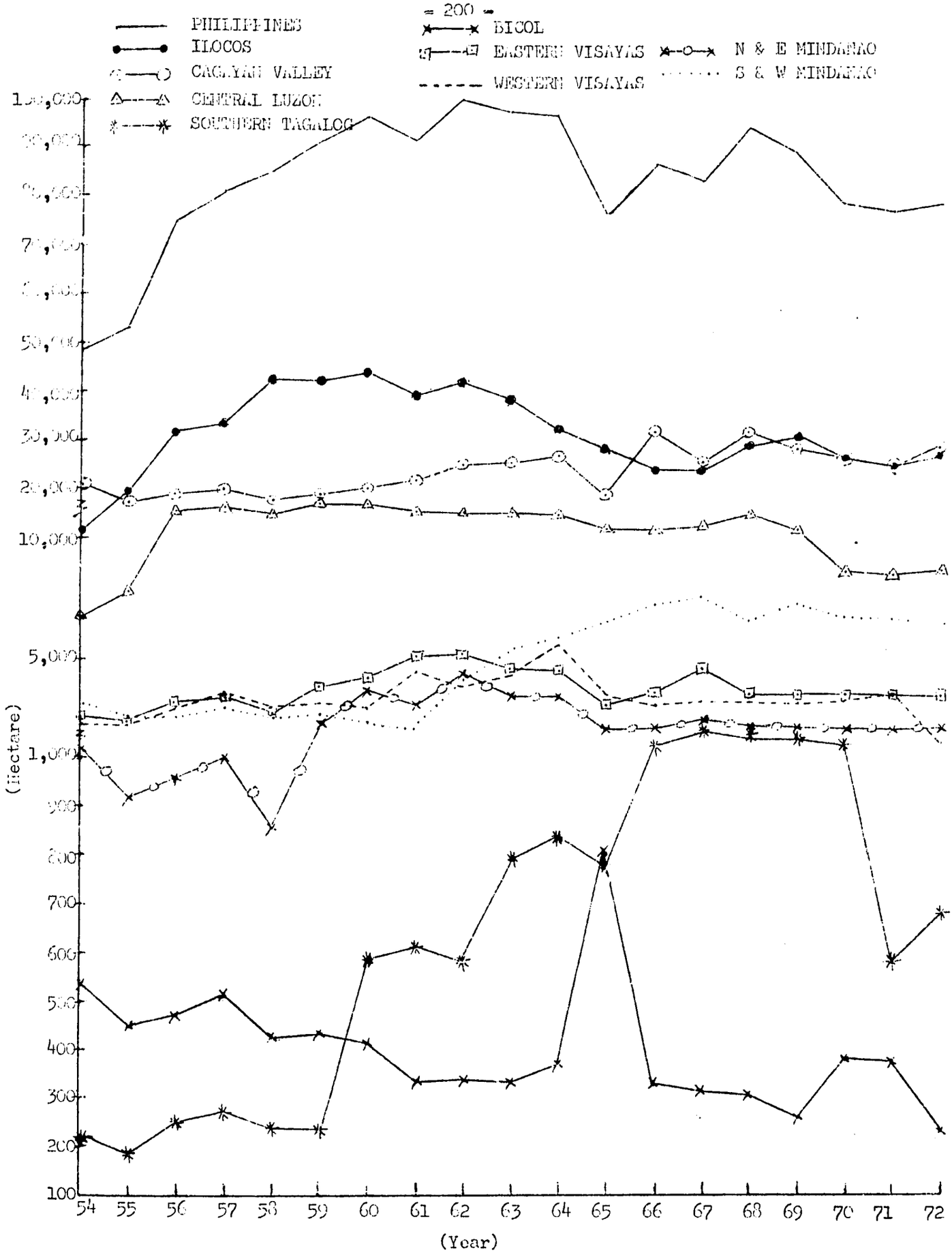

Fig. 14.4. Trends in tobacco area by region, Philippines, 1954-1972

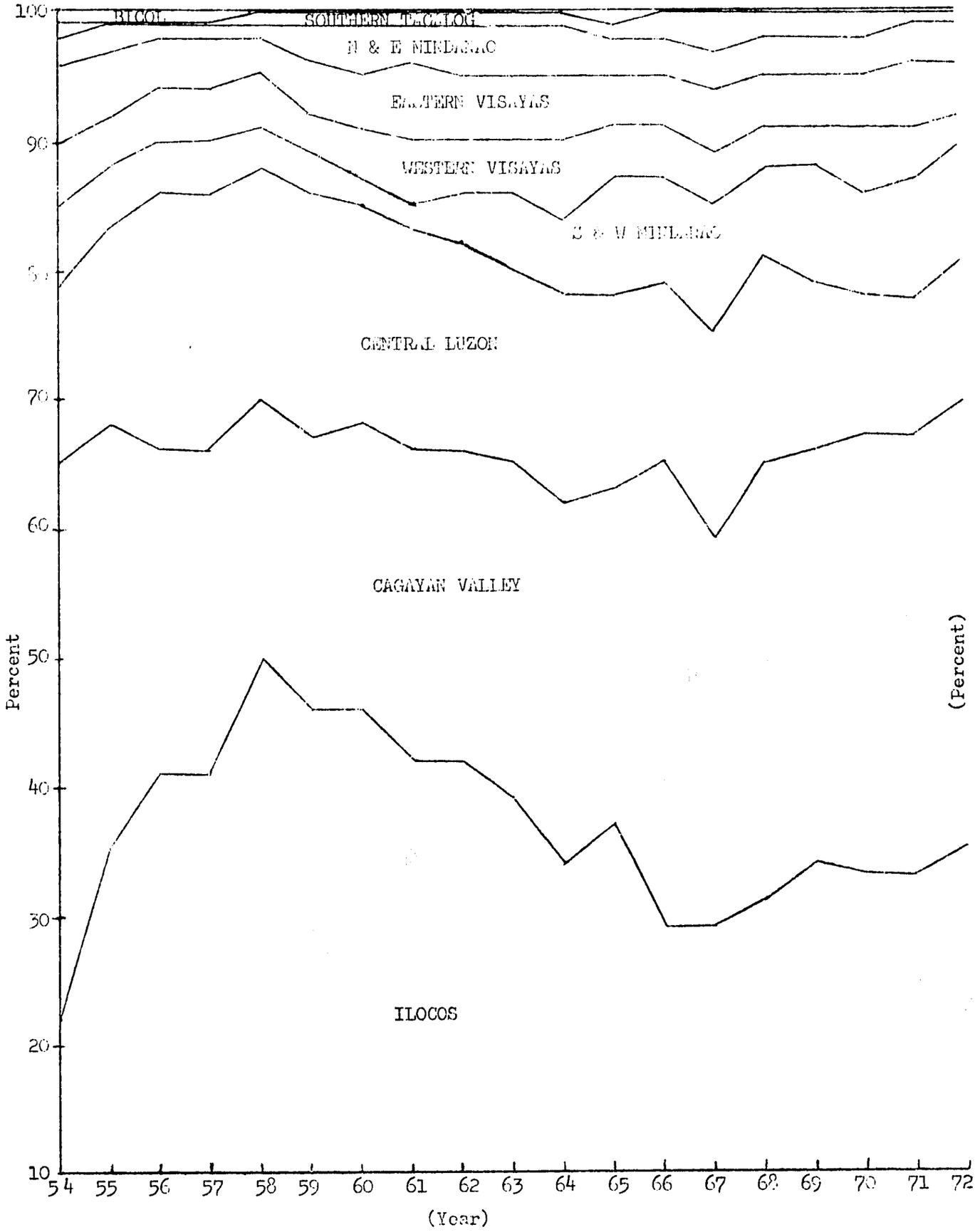

Fig. 14.5. Relative contribution of various regions to total tobacco area, Philippines, 1954-1972

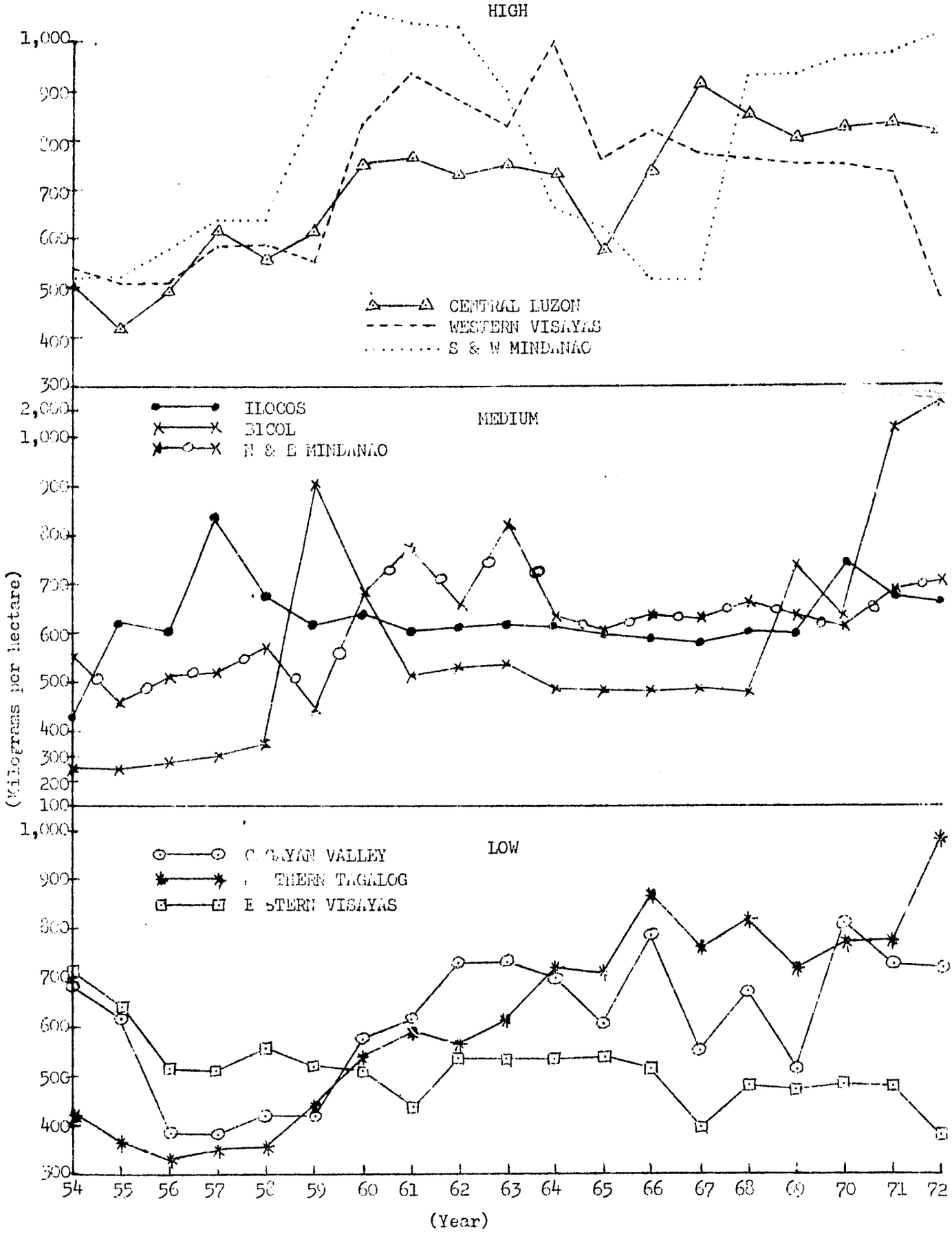

Fig. 14.6. Trends in tobacco yields in various regions, Philippines, 1954-1972

to 1969/72 all regions except Cagayan Valley, Southern Tagalog and Southern and Western Mindanao decreased in area by as much as 15.3 to 36.8 per cent. For the period 1962/65 and 1969/72, Central Luzon and Bicol showed negative changes in area. Southern Tagalog and the two Mindanao regions exhibited the highest positive changes in area during the same period (Table 13.4).

In 1955, Ilocos region had the highest contribution of 45.7 per cent of the total national acreage planted to tobacco. The relative contribution of the region declined moderately during the succeeding years. Next to Ilocos in tobacco hectarage was Cagayan Valley with a relative contribution to total area ranging from 26.2 to 42.9 per cent.

On the other hand, Central Luzon contributed between 19 to 26 per cent of the total tobacco acreage. Central Luzon and Southern Tagalog had the least tobacco area among the nine regions.

Yield variations

Except for Eastern Visayas, all regions exhibited increasing productivity from 1954 to 1972. The national trend in yield increased at an annual rate of 1.2 per cent.

Southern and Western Mindanao, Central Luzon and Western Visayas were considered high yielding regions; Bicol, Ilocos and Northern and Eastern Mindanao, as medium yielding regions; and Southern Tagalog, Cagayan Valley and Eastern Visayas, as low yielding region (Figure 14.6).

Table 14.5. Effects of regional area shifts on the national yield of tobacco, 1954/58 to 1969/72

Year	Acreage Distribution Used as Weight			
	1954/58	1959/63	1964/68	1969/72
	kilograms per hectare			
1954/58	570.2	582.3	565.0	567.5
1959/63	602.7	657.2	680.8	680.1
1964/68	654.6	649.8	657.4	651.8
1969/72	709.5	702.2	717.8	714.9
	yield index (1954/58 = 100)			
1954/58	100.0	101.0	98.1	98.5
1959/63	115.0	114.2	118.2	118.0
1964/68	113.6	112.8	114.1	113.1
1969/72	123.1	121.9	124.6	124.1

For the period 1954/57 and 1969/72, the average change in yield was highest in Bicol (30.4%) followed by Southern Tagalog (119.1%) and Southern Tagalog (11.1%) and Southern and Western Mindanao (74.[illegible]). Eastern Visayas had a negative change of -23.1 per cent during the same period.

Effects of Regional Area Shifts on National Yield

Table 14.5 shows no significant effect of regional area shifts on the national yield of tobacco. If acreage distribution had remained constant between 1954/58 and 1969/72, yield per hectare would have increased from 576.2 to 709.5 kilograms instead of the actual yield of 714.9 kilograms. This means that the actual yield per hectare in 1969/72 was higher by 138.7 kilograms or 23.1 per cent than in 1954/58.

The table also shows that the average national yields in 1959/63 and 1964/68 were about equal. They were higher by 14 per cent than the 1954/58 yield but lower by 10 per cent than the 1969/72 yield.

CHAPTER XV

SUMMARY AND CONCLUSION

This study analyzed national and regional trends and changes in production, area and yield of eight food (rice, corn, fruits and nuts, rootcrops, cacao and coffee, vegetables, beans and peas, and citrus) and four commercial (coconut, sugarcane, abaca and tobacco) crops in the Philippines from 1954 to 1972. For each crop, the annual growth rates in production, area and yield, relative influence of area and yield on production changes, relative contribution of each region to total production and area, and effects of regional acreage distribution on national yield were determined.

Annual Growth Rates in Production, Area and Yield

The annual growth rates of the national production of rice and sugarcane were 2.5 per cent; and of citrus, tobacco, coconut and vegetables were 4.2, 3.8, 3.2 and 2.7 per cent, respectively. Cacao and coffee production had the highest rate of increase with 11.1 per cent per year while beans and peas had a negative growth rate of 2.6 per cent per year.

Cacao and coffee also exhibited the highest annual growth rate in hectarage with 5.1 per cent followed by corn, coconut, and tobacco with 4.2 and 4.1 and 2.5 per cent, respectively. Rice and fruits and nuts hectarage increased annually at the rate of one per cent only. The rest of the crops showed nil and even negative growth rates in area.

The national yield of cacao and coffee, fruits and nuts, vegetables, and abaca increased annually at the rate of 5.7, 5.1 and 5.0 and 2.6 per cent, respectively; and of rice and tobacco more than one per cent.

Changes in Production, Area and Yield

Throughout the 19-year period, all crops showed fluctuating but generally increasing trends in production except rootcrops, abaca, tobacco and beans and peas which exhibited decreasing trends from 1962 to 1972 owing to decreases in hectarage of these crops during the same period. Except for some mild fluctuations, hectarage trends of rice, vegetables and fruits and nuts were relatively stable between 1961 and 1971.

Trends in yield of coconut and sugarcane were slightly decreasing from 1959 to 1972 while those of abaca, corn, rice, citrus and vegetables were slightly increasing. Fruits and nuts, vegetables and tobacco, showed spectacular yield increases although tobacco exhibited great fluctuations in yield.

A comparison of the average percentage changes in production, area and yield between the first (1954/57 - 1962/65) and second (1962/65 - 1969/72) periods considered shows that the magnitude of the changes were greater during the former than the latter period in all crops except for rice and vegetables in the case of production; also for vegetables and sugarcane, in area; and for rice, corn and citrus in the case of yield. The area devoted to rootcrops,

Table 15.1. Growth rates and periodical changes in production, area and yield by crop, Philippines, 1954-1972

Region	PRODUCTION				AREA				YIELD			
	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57 1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57 1969/72	Growth rate 1/ 1954/72	Average Changes 1954/57:1962/65	1962/65:1969/72	1954/57 1969/72
Rice	2.5	20.9	28.1	54.9	1.1	16.8	1.4	18.4	1.4	3.5	26.3	30.7
Corn	5.1	53.4	50.8	131.3	4.2	30.4	22.0	59.1	0.9	17.6	23.6	45.4
Fruits and Nuts	6.1	81.5	44.5	162.3	1.0	10.9	1.7	12.6	5.1	63.7	41.9	132.4
Rootcrops	0.2	17.2	-11.9	3.3	nil	-2.2	-7.1	-9.2	0.4	19.8	-5.3	13.5
Cacao & Coffee	11.1	403.1	20.9	508.1	5.1	107.3	14.2	136.6	5.7	142.4	6.3	157.6
Vegetables	2.7	8.6	44.6	57.0	-2.1	-42.5	5.8	-39.3	5.0	88.9	36.7	158.2
Beans and Peas	-2.6	-29.0	-23.2	-45.3	-2.0	-9.4	-25.3	-32.3	-0.5	-21.5	2.7	-19.2
Citrus	4.2	99.4	6.7	112.7	nil	42.6	-26.7	4.6	4.2	39.8	45.5	103.4
Coconut	3.2	37.4	6.3	46.0	4.1	49.4	37.1	99.4	-0.8	-5.5	-22.6	-26.7
Sugarcane	2.5	37.3	16.3	59.8	2.7	12.5	40.4	58.0	-0.2	22.1	-17.1	1.2
Abaca	0.2	11.5	-13.5	-3.6	-2.5	-14.3	-16.3	-28.3	2.8	30.0	3.2	54.4
Tobacco	3.8	68.8	-7.2	56.5	2.5	44.0	-10.7	28.6	1.2	17.2	3.8	21.7

1/ Annual growth rate is computed by the formula:

$$r = \sqrt[t]{\frac{A_t}{A_o}} - 1$$

where: r = annual rate of growth in production, area or yield
t = number of years
A_t = index of production, area or yield in 1972
A_o = index of production, area or yield in 1954

vegetables, beans and peas, and abaca showed negative changes during the two periods.

The percentage yield increases being greater during the second than the first period for rice, corn and citrus indicate that government efforts during the past decade to increase agricultural productivity have been directed mainly to the primary staple crops of the Philippines. Negative changes in the yield of coconut and sugarcane, show the need for having government production programs for these major export crops of the country, similar to those for rice and corn, to improve productivity of and income from these crops.

Relative influence of Area and Yield on Production Changes

During the first period, changes in production of rice, corn, citrus, coconut and tobacco were influenced more by area than yield. In contrast, yield had a greater influence than area on the changes in production of rice, corn, fruits and nuts and citrus during the second period. Changes in production of the four export crops and two of the food crops (corn and beans and peas) were primarily due to area rathern than yield during the third period (1954/57-1969/72).

Of the changes in rice and corn production during the first period, 81.8 per cent of the former and 62.1 per cent of the latter were accounted for by area expansion. On the other hand, 94.9 and 51.6 per cent of the production changes in rice and corn, respectively, were influence by yield increases during the second period.

Table 15.2. Relative influence of area and yield on production by year and by crop, Philippines, 1954-1972

Year/Crops	Change in Production	Change Because of Area a/	Change Because of Yield b/	LI Term c/	Total
1954/57 to 1962/65					
Rice	20.9	81.8	18.1	.1	100
Corn	53.4	62.1	37.9	nil	100
Fruits and Nuts	81.5	17.4	86.1	-3.5	100
Rootcrops	17.2	-14.2	113.6	.6	100
Cacao and Coffee	403.1	45.1	54.9	nil	100
Vegetables	8.6	-675.3	775.3	nil	100
Beans and Peas	-29.0	28.9	71.1	nil	100
Citrus	99.4	51.4	48.6	nil	100
Coconut	37.4	117.8	-18.0	.2	100
Sugarcane	37.3	37.1	62.8	.1	100
Abaca	11.5	-142.1	242.1	nil	100
Tobacco	68.8	69.7	30.3	nil	100
1962/65 to 1969/72					
Rice	28.1	5.6	94.9	-.5	100
Corn	50.8	48.4	51.6	nil	100
Fruits and Nuts	44.5	5.2	95.1	-.2	100
Rootcrops	-11.9	57.7	42.5	-.2	100
Cacao and Coffee	20.9	69.9	30.1	nil	100
Vegetables	44.6	15.2	84.8	nil	100
Beans and Peas	-23.2	110.7	-10.7	nil	100
Citrus	6.7	-480.9	580.9	nil	100
Coconut	6.3	515.9	-417.6	1.7	100
Sugarcane	16.3	224.0	-123.7	-.3	100
Abaca	-13.5	121.9	-21.9	nil	100
Tobacco	- 7.2	149.4	-49.4	nil	100
1954/57 to 1969/72					
Rice	54.9	38.9	61.5	-.4	100
Corn	131.3	55.4	44.6	nil	100
Fruits and Nuts	162.3	12.6	89.6	-2.2	100
Rootcrops	3.3	-300.4	400.5	-.1	100
Cacao and Coffee	508.1	47.7	52.3	nil	100
Vegetables	57.9	-110.4	210.4	nil	100
Beans and Peas	-45.3	64.6	35.4	nil	100
Citrus	112.7	5.9	94.1	nil	100
Coconut	46.0	182.1	-82.0	-.1	100
Sugarcane	59.8	97.5	2.5	nil	100
Abaca	- 3.6	906.1	-806.1	nil	100
Tobacco	56.5	56.2	43.8	nil	100

Top Regions Relative to Crop Production, Area and Yield

The 19-year average production and hectarage data show that Central Luzon topped all other regions in rice and vegetables; Ilocos, in tobacco; Western Visayas, in sugarcane and beans and peas; Eastern Visayas, in rootcrops; Southern Tagalog, in cacao and coffee; and Southern and Western Mindanao, in corn. Southern Tagalog was also top in coconut and citrus production, Southern and Western Mindanao in abaca production, and Northern and Eastern Mindanao in fruits and nuts production. However, Southern Tagalog and Eastern Visayas has the highest average fruits and nuts and coconut hectarage, respectively while Bicol had the greatest abaca and citrus hectarage.

Central Luzon, Northern and Eastern Mindanao, Western Visayas and Southern Tagalog had the highest 19-year average yield of rice, fruits and nuts, sugarcane and coconut, respectively. As noted above, these regions had also the greatest production of the corresponding crops. Among the regions, Southern and Western Mindanao had the highest yield of corn, rootcrops, tobacco and beans and peas. The highest yielding region for abaca and citrus was Northern and Eastern Mindanao, for vegetables was Bicol, and for cacao and coffee, Cagayan Valley.

Effects of Regional Area Shifts on National Yield

Regional changes in acreage distribution from 1954 to 1972 had no pronounced effect on the national yield of rice, cacao and coffee, coconut, abaca and tobacco. On the other hand, positive effects of the

Table 15.3. Top three regions in average production, area and yield by crop, Philippines, 1954-1972

Crop	Rank	Production	Area	Yield
Rice	First	Central Luzon	Central Luzon	Central Luzon
	Second	Western Visayas	Eastern Visayas	Ilocos
	Third	S & W Mindanao	S & W Mindanao	Cagayan Valley
Corn	First	S & W Mindanao	S & W Mindanao	Cagayan Valley
	Second	Eastern Visayas	Eastern Visayas	S & W Mindanao
	Third	Western Visayas	Western Visayas	Southern Tagalog
Fruits and Nuts	First	N & E Mindanao	Southern Tagalog	N & E Mindanao
	Second	Eastern Visayas	Eastern Visayas	Cagayan Valley
	Third	Southern Tagalog	Western Visayas	S & W Mindanao
Rootcrops	First	Eastern Visayas	Eastern Visayas	S & W Mindanao
	Second	S & W Mindanao	N & E Mindanao	Ilocos
	Third	N & E Mindanao	[illegible]	Cagayan Valley
Cacao and Coffee	First	Southern Tagalog	Southern Tagalog	Cagayan Valley
	Second	N & E Mindanao	N & E Mindanao	S & W Mindanao
	Third	S & W Mindanao	S & W Mindanao	N & E Mindanao
Vegetables	First	Central Luzon	Central Luzon	Bicol
	Second	Cagayan Valley	Ilocos	Cagayan Valley
	Third	Ilocos	Southern Tagalog	Western Visayas
Beans and Peas	First	Western Visayas	Western Visayas	S & W Mindanao
	Second	Central Luzon	Central Luzon	N & E Mindanao
	Third	Cagayan Valley	Cagayan Valley	Cagayan Valley
Citrus	First	Southern Tagalog	Southern Tagalog	N & E Mindanao
	Second	S & W Mindanao	Central Luzon	S & W Mindanao
	Third	Bicol	Bicol	Cagayan Valley
Coconut	First	Southern Tagalog	Eastern Visayas	Southern Tagalog
	Second	Eastern Visayas	Southern Tagalog	S & W Mindanao
	Third	[illegible]	S & W Mindanao	N & E Mindanao
Sugarcane	First	Western Visayas	Western Visayas	Western Visayas
	Second	Central Luzon	Central Luzon	Southern Tagalog
	Third	Southern Tagalog	Southern Tagalog	Eastern Visayas
Abaca	First	S & W Mindanao	Bicol	& E Mindanao
	Second	Bicol	S & W Mindanao	S & W Mindanao
	Third	Eastern Visayas	Eastern Visayas	Eastern Visayas
Tobacco	First	Ilocos	Ilocos	S & W Mindanao
	Second	Cagayan Valley	Cagayan Valley	Western Visayas
	Third	Central Luzon	Central Luzon	Central Luzon

regional area shifts on the national yield of corn, fruits and nuts, citrus and sugarcane were observed, indicating area shifts of these crops from the lower to the higher yielding regions. On the other hand, changes in acreage distribution among regions had negative effects on the national yield of rootcrops, vegetables, and beans and peas.

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Appendix Table 1. Palay (rough rice): Production by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
				thousand cavans of 44 kilograms						
1954	1,833.5	7,824.2	19,220.1	8,956.5	6,010.1	5,917.3	11,261.1	6,522.2	4,803.0	72,328.0
1955	2,580.4	7,039.9	19,605.1	8,291.7	5,445.8	6,862.6	10,779.3	5,202.6	6,985.9	72,793.3
1956	2,467.4	6,640.2	21,194.6	8,073.7	5,139.6	6,909.0	11,035.3	5,308.6	7,305.9	74,074.3
1957	2,772.8	6,720.4	21,984.7	8,431.9	5,189.5	7,042.7	11,032.9	5,380.6	7,488.7	76,044.2
1958	2,334.3	6,107.3	22,433.1	8,821.1	5,559.7	4,805.1	9,485.8	4,071.7	9,183.2	72,806.3
1959	2,634.9	7,570.8	26,433.1	11,009.7	6,709.1	6,145.2	11,122.1	4,785.0	7,328.8	83,738.7
1960	2,372.0	10,807.4	21,552.4	9,097.1	6,034.6	8,785.3	13,853.3	5,293.2	7,198.5	84,988.8
1961	3,212.7	11,217.9	19,517.6	8,677.8	7,402.0	7,650.9	11,895.7	3,318.9	11,395.5	84,289.1
1962	3,172.1	10,197.1	20,967.5	11,008.0	7,245.0	5,765.2	11,341.3	4,860.8	14,307.9	88,864.9
1963	3,419.4	9,139.3	21,579.6	10,258.1	8,688.0	5,865.5	10,949.6	4,544.6	15,714.6	90,158.7
1964	3,306.4	7,462.5	20,979.9	10,420.8	8,397.0	5,315.1	10,712.5	4,582.6	16,160.9	87,337.7
1965	3,716.9	9,439.5	21,086.7	10,817.2	8,315.7	5,737.1	11,159.6	4,575.4	15,889.7	90,737.8
1966	4,767.6	12,214.3	23,422.1	12,574.2	12,515.3	5,098.1	9,374.9	2,783.9	9,833.5	92,559.9
1967	4,602.5	8,499.9	23,624.2	13,691.8	9,072.1	6,394.8	11,612.1	3,758.1	11,770.5	93,045.9
1968	5,715.0	10,931.1	26,367.0	15,232.9	9,861.2	6,755.8	13,525.3	4,222.5	12,041.4	103,652.2
1969	5,980.9	7,881.1	25,666.7	14,094.4	10,216.5	7,542.7	11,481.1	5,628.9	12,592.6	101,014.9
1970	5,742.2	11,146.5	32,085.1	13,981.4	12,618.8	6,358.1	13,657.1	6,344.8	17,007.1	118,941.1
1971	6,967.2	13,524.5	33,291.4	14,573.9	8,587.3	7,596.4	15,042.3	7,742.1	14,104.8	121,429.9
1972	7,070.0	13,724.1	24,468.4	13,210.2	12,386.8	7,299.3	13,627.3	7,641.3	16,483.6	115,911.0

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City

Appendix Table 2. Palay (rough rice): Area harvested by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
1954	105,810	216,280	634,120	325,390	281,080	329,770	437,120	212,320	103,550	2,645,440
1955	100,850	237,340	573,340	331,620	265,330	297,130	484,900	155,820	209,210	2,655,540
1956	95,500	234,010	588,800	320,080	253,870	294,980	547,450	169,730	238,060	2,742,480
1957	102,400	236,960	602,170	337,120	260,810	285,400	531,070	169,590	242,600	2,768,120
1958	105,530	249,780	698,180	399,210	293,230	294,680	508,870	215,010	389,610	3,154,100
1959	115,420	260,880	769,630	480,030	302,990	323,080	569,840	198,100	309,440	3,329,410
1960	104,750	344,380	682,520	377,080	239,650	428,980	569,080	252,070	307,950	3,306,460
1961	110,630	453,890	545,730	363,850	317,800	377,940	414,310	172,380	441,220	3,197,750
1962	104,620	370,620	513,550	406,860	290,540	283,770	400,960	254,490	555,780	3,181,190
1963	119,920	313,250	520,760	398,410	310,530	289,760	415,950	243,350	549,390	3,161,320
1964	120,080	289,710	495,700	414,080	305,370	274,600	396,310	226,100	565,500	3,087,450
1965	139,220	344,180	510,240	433,280	299,260	299,470	383,680	218,600	571,740	3,199,670
1966	144,710	334,390	519,310	467,290	366,910	323,480	377,870	145,090	410,130	3,109,180
1967	132,290	265,520	602,060	466,990	300,980	346,850	333,200	180,850	467,380	3,096,120
1968	140,950	296,760	628,010	529,740	314,560	349,780	376,210	207,630	460,020	3,303,660
1969	136,160	265,010	608,840	538,080	300,320	382,940	384,900	248,650	467,250	3,332,150
1970	142,247	316,613	634,750	345,370	357,960	256,580	397,810	194,330	467,780	3,113,440
1971	151,460	337,120	641,490	387,030	298,480	252,950	420,570	212,960	410,570	3,112,630
1972	164,151	365,369	671,070	408,780	273,560	270,730	424,950	229,860	437,910	3,246,380

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City

Appendix Table 3. Palay (rough rice): Yield per hectare by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
				cavans of 44 kilograms						
1954	17.33	36.18	30.31	27.46	21.38	17.94	25.76	30.72	46.38	27.34
1955	25.59	29.66	34.19	25.50	20.52	23.10	22.23	33.39	33.39	27.41
1956	25.84	28.38	36.00	25.22	20.25	23.42	20.16	31.28	30.69	27.01
1957	27.08	28.36	36.51	25.01	19.90	24.68	20.77	31.73	30.87	27.47
1958	22.12	24.45	32.13	22.10	18.96	16.31	18.64	18.94	23.58	23.08
1959	22.83	29.02	34.35	22.94	22.14	19.07	19.52	24.15	23.68	25.15
1960	22.60	31.37	31.58	24.13	23.18	20.50	24.30	21.00	23.35	25.70
1961	29.04	24.70	35.76	23.85	23.29	20.20	28.70	19.25	25.83	26.36
1962	30.32	27.51	40.83	27.06	24.94	20.30	28.30	19.10	24.44	27.95
1963	28.48	31.55	43.53	24.77	28.45	20.20	26.30	20.15	27.72	29.20
1964	27.55	25.76	42.32	25.17	27.50	19.33	27.03	20.37	28.58	28.29
1965	26.70	27.43	41.33	25.00	27.79	20.93	29.00	29.93	27.75	29.77
1966	32.95	34.47	45.10	26.91	34.10	15.80	24.81	19.19	23.90	28.36
1967	34.94	32.01	39.24	29.32	30.14	18.44	34.55	20.78	25.20	30.05
1968	40.55	36.83	42.00	28.76	31.35	19.31	33.29	20.34	26.13	31.37
1969	43.93	29.74	42.16	26.10	34.02	19.70	29.83	22.64	26.80	30.32
1970	40.37	35.21	50.55	40.48	35.25	24.78	34.33	32.65	36.36	38.20
1971	46.00	40.12	51.90	37.66	28.77	30.00	35.77	36.35	34.35	39.01
1972	43.07	37.56	36.46	32.32	45.28	26.96	32.06	33.24	37.64	35.70

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 4. Production of corn (shelled) by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
				thousand cavans of 57 kilograms						
1954	180.9	1,505.8	542.1	835.9	591.5	3,172.6	2,654.6	1,883.6	2,333.0	13,700.0
1955	160.8	1,679.0	490.0	823.0	642.0	3,402.1	1,995.6	1,720.0	2,598.5	13,511.0
1956	206.9	1,714.9	897.1	868.0	518.9	3,037.5	2,466.7	1,590.1	4,618.8	15,918.9
1957	183.0	1,660.5	930.9	883.3	528.3	2,952.6	2,407.4	1,557.1	4,631.9	15,708.0
1958	221.8	1,631.6	353.6	389.2	1,187.6	1,476.7	1,034.6	2,801.3	5,852.2	14,948.6
1959	235.5	1,984.6	554.1	856.8	1,438.9	2,665.5	2,148.8	2,427.7	5,511.1	17,823.0
1960	192.2	1,525.2	849.3	949.5	839.4	4,087.9	2,647.4	3,285.2	6,067.3	20,443.4
1961	198.6	2,420.9	665.8	767.2	721.7	3,119.5	3,190.4	3,533.3	6,602.9	21,220.3
1962	111.3	1,771.7	556.9	1,230.3	647.1	3,367.0	2,719.3	3,233.5	8,578.0	22,215.1
1963	114.1	2,093.9	556.7	1,255.2	742.0	2,894.7	2,474.4	2,671.6	9,528.1	22,330.7
1964	118.5	1,970.2	530.5	1,350.0	735.0	2,718.4	2,579.9	2,698.4	9,978.2	22,679.1
1965	116.2	2,041.1	527.5	1,386.9	772.5	2,631.1	2,763.6	2,585.2	10,208.4	23,032.5
1966	146.9	1,147.9	529.9	1,136.3	1,038.9	3,355.7	2,136.4	2,748.4	11,967.1	24,207.5
1967	154.2	985.5	577.7	1,194.6	1,079.6	3,497.5	1,895.1	3,175.9	13,579.4	26,139.5
1968	150.6	2,053.8	639.1	1,266.9	1,255.6	3,573.4	2,741.2	3,116.2	13,609.4	28,406.2
1969	152.5	2,098.5	683.0	1,670.5	1,146.1	2,925.7	3,136.2	3,023.1	15,565.0	30,400.6
1970	296.3	3,407.4	736.3	2,625.2	1,185.4	3,189.4	3,361.7	2,993.1	17,437.0	35,231.8
1971	329.4	3,788.6	853.0	2,841.0	1,240.0	3,150.0	3,679.0	2,802.0	16,492.0	35,175.0
1972	371.4	4,271.0	1,183.7	2,347.1	1,237.6	3,043.4	2,893.9	3,147.2	16,813.6	35,308.9

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City

Appendix Table 5. Harvested area of corn (shelled) by region, Philippines, 1954-1972

YEAR	ILOCOS	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
				hectares						
1954	16,800	92,960	49,280	66,080	53,760	303,920	228,080	145,600	163,520	1,120,000
1955	19,200	110,100	59,900	82,900	66,400	449,800	204,900	186,300	208,900	1,388,400
1956	20,910	100,220	98,480	90,320	64,530	442,340	303,940	173,830	371,130	1,674,800
1957	18,700	110,290	95,030	114,650	60,530	484,060	357,900	174,440	370,590	1,786,790
1958	18,220	128,810	41,550	63,410	121,480	243,000	161,[illegible]	208,110	364,[illegible]	1,380,620
1959	24,890	172,[illegible]	59,600	84,800	171,200	504,960	319,[illegible]	225,220	393,890	2,106,980
1960	21,240	127,570	71,470	80,490	76,320	446,220	302,600	269,270	449,[illegible]	1,845,540
1961	24,020	151,110	77,410	107,670	86,790	345,040	337,850	328,610	586,[illegible]	2,045,460
1962	20,560	155,[illegible]	71,540	105,220	77,430	421,700	272,190	283,540	630,[illegible]	2,016,270
1963	19,320	1[illegible],[illegible]70	63,700	90,280	72,590	393,580	257,370	234,910	625,[illegible]	1,949,510
1964	16,540	118,140	52,110	94,930	66,920	366,640	272,220	215,610	607,460	1,897,570
1965	16,460	151,770	58,550	93,290	70,170	367,610	275,210	210,550	7[illegible],110	1,922,750
1966	16,110	150,590	55,030	118,630	87,140	419,710	250,970	223,720	9[illegible],180	2,106,080
1967	16,180	90,400	5[illegible],700	119,770	90,850	483,610	195,940	264,990	8[illegible],400	2,157,950
1968	15,000	185,520	58,450	117,790	95,980	402,390	271,540	253,340	8[illegible],[illegible]	2,247,860
1969	17,310	157,150	81,200	127,440	97,230	3[illegible],960	2[illegible],[illegible]	264,030	[illegible]	2,253,140
1970	26,634	195,316	79,260	161,420	101,540	33[illegible]	303,990	260,700	957,510	2,419,600
1971	30,100	230,000	82,300	154,500	99,400	324,[illegible]	301,700	262,700	896,[illegible]	2,392,200
1972	34,572	233,528	91,220	163,200	120,270	311,510	284,550	265,140	907,710	2,431,700

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 6. Yield per hectare of corn (shelled) by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					cavans of 57 kilograms					
1954	10.77	16.20	11.00	12.65	11.00	10.44	11.64	12.93	14.27	12.23
1955	8.38	15.25	8.18	9.93	9.67	7.56	9.74	9.23	12.44	9.73
1956	9.89	15.70	9.11	9.61	8.04	6.87	8.12	9.15	12.44	9.50
1957	9.79	15.06	9.45	7.70	8.73	6.10	6.73	8.93	12.50	8.79
1958	12.17	12.67	8.51	6.14	9.78	6.08	6.39	11.76	16.07	10.83
1959	9.46	11.53	9.28	10.10	8.40	5.38	6.93	10.76	9.95	8.46
1960	9.05	11.86	11.88	11.80	11.00	9.16	8.75	12.20	13.50	11.08
1961	8.27	16.02	8.60	7.13	8.32	9.04	9.44	10.75	11.25	10.37
1962	5.41	17.25	7.78	11.69	8.35	7.98	9.99	11.40	13.61	11.02
1963	5.91	16.58	8.74	12.96	10.25	[illegible]	[illegible]	11.37	13.91	[illegible]
1964	7.16	11.68	9.29	14.22	10.66	7.44	9.48	12.52	14.51	11.95
1965	7.05	11.76	9.01	14.87	11.01	7.16	10.04	12.28	14.40	11.98
1966	9.12	14.19	9.63	9.58	11.92	8.00	8.51	12.28	14.38	11.49
1967	9.53	10.90	9.84	9.97	11.88	8.26	9.67	11.98	15.13	12.11
1968	10.00	15.38	10.93	10.76	13.08	8.88	10.10	12.30	15.13	12.64
1969	8.81	13.36	8.41	13.11	11.79	9.47	10.67	11.45	17.12	13.47
1970	11.12	17.45	9.29	16.26	11.67	9.57	11.06	11.48	18.21	14.56
1971	10.55	15.89	10.36	17.27	12.47	9.70	12.19	10.67	18.39	14.70
1972	10.74	14.94	12.98	14.38	10.29	9.77	10.17	11.87	18.52	14.52

a/ 1970-72 published BAEcon. data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 7. Production of fruits and nuts except citrus by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	20,628	21,350	57,721	81,236	52,383	70,052	71,577	106,287	78,916	560,150
1955	21,614	22,327	62,207	84,799	54,355	82,825	74,599	110,532	82,199	595,457
1956	22,316	23,062	64,552	87,507	56,203	85,122	76,976	114,341	84,971	615,050
1957	23,185	23,942	67,694	91,157	58,064	88,476	79,869	117,671	88,218	638,275
1958	24,559	25,458	71,934	96,842	61,534	93,908	84,764	125,297	93,738	678,034
1959	22,332	24,235	70,545	94,355	54,404	92,879	84,409	124,850	87,237	655,246
1960	23,439	27,294	81,829	98,312	70,224	66,139	75,930	152,536	79,704	675,407
1961	22,209	66,470	90,544	111,430	44,557	64,463	82,120	135,560	83,224	700,667
1962	27,094	32,497	99,305	147,071	70,806	216,779	127,570	153,281	59,156	933,559
1963	27,151	42,133	86,784	195,680	74,616	217,143	122,811	169,236	70,082	1,005,636
1964	27,437	65,185	89,294	162,058	80,311	364,117	154,496	210,591	65,642	1,219,131
1965	25,067	98,155	93,896	171,576	103,749	246,494	148,007	241,109	85,431	1,213,484
1966	22,386	92,395	107,179	174,329	120,259	211,534	161,231	237,183	110,939	1,237,935
1967	23,862	97,151	102,354	177,405	99,399	283,427	179,225	262,432	127,578	1,352,833
1968	20,680	119,743	114,027	183,870	68,199	203,013	235,101	265,969	160,792	1,371,403
1969	21,283	92,587	132,787	183,761	79,279	179,148	224,141	273,884	186,432	1,373,302
1970	21,340	97,217	175,510	201,786	77,606	182,332	345,181	276,930	191,263	1,569,665
1971	24,314	110,762	151,367	157,750	45,488	288,335	294,782	296,534	268,603	1,637,935
1972	14,264	103,670	218,399	176,617	66,223	213,434	264,663	344,729	336,497	1,738,496

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 8. Harvested area of fruits and nuts except citrus by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	14,540	13,320	40,600	57,940	27,030	45,860	45,790	41,210	30,490	316,800
1955	15,260	14,030	42,530	60,640	28,400	48,160	48,040	43,260	32,020	332,340
1956	15,270	14,050	42,540	60,610	28,400	48,150	48,060	43,290	32,030	332,400
1957	15,860	14,590	44,380	62,860	29,440	49,830	49,850	44,870	33,250	344,930
1958	16,820	15,570	47,020	66,570	31,260	53,120	52,900	47,590	35,160	365,810
1959	15,850	14,610	44,770	61,610	29,910	52,270	52,040	46,900	30,340	349,000
1960	13,950	12,650	50,410	58,220	30,390	37,770	42,540	40,710	27,030	319,650
1961	13,240	41,680	57,660	55,730	33,690	50,100	69,310	38,240	28,880	358,470
1962	13,650	15,450	50,670	56,280	27,460	52,570	64,550	34,390	21,450	366,470
1963	16,060	8,640	47,640	62,780	28,350	50,220	62,180	33,420	26,710	366,000
1964	14,240	10,200	53,580	69,600	38,740	59,440	50,950	41,070	26,820	364,640
1965	12,450	14,820	47,100	66,830	41,840	66,020	48,500	43,950	30,540	372,050
1966	12,080	15,860	46,810	60,450	42,720	56,920	50,060	36,930	31,120	352,950
1967	11,900	14,810	46,050	57,640	39,780	64,730	51,520	37,350	29,360	353,820
1968	10,170	15,200	47,130	70,020	39,240	61,740	57,010	37,960	36,810	369,880
1969	10,140	14,090	51,580	70,610	37,860	49,350	54,300	40,390	39,710	368,030
1970	10,789	14,301	56,810	69,780	38,600	49,810	57,110	41,870	41,190	380,260
1971	12,629	16,741	49,680	60,220	26,940	51,650	47,990	52,470	42,470	360,790
1972	11,872	15,738	50,890	64,730	28,900	53,390	51,550	52,020	55,370	384,960

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 9. Yield per hectare of fruits and nuts except citrus by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY	a/CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	1,419	1,603	1,422	1,402	1,936	1,527	1,563	2,579	2,588	1,768
1955	1,416	1,591	1,463	1,398	1,914	1,720	1,553	2,555	2,567	1,792
1956	1,461	1,641	1,517	1,444	1,879	1,768	1,602	2,641	2,653	1,850
1957	1,462	1,641	1,525	1,450	1,972	1,776	1,602	2,622	2,653	1,850
1958	1,460	1,656	1,530	1,455	1,968	1,768	1,602	2,633	2,660	1,854
1959	1,409	1,636	1,576	1,531	1,819	1,394	1,622	2,662	2,829	1,878
1960	1,683	2,158	1,623	1,689	2,311	1,751	1,564	3,747	2,949	2,113
1961	1,684	1,595	1,570	1,999	1,886	2,142	1,185	3,545	2,882	1,955
1962	1,985	2,103	1,960	2,613	2,579	2,625	1,976	4,457	2,758	2,547
1963	1,691	4,877	1,822	3,117	2,632	2,797	1,975	5,064	2,624	2,748
1964	1,927	6,391	1,667	2,328	2,073	6,126	3,032	5,128	2,448	3,343
1965	2,013	6,623	1,994	2,367	2,480	3,734	3,052	5,486	2,797	3,262
1966	1,853	5,826	2,290	2,892	2,815	3,716	3,221	6,423	3,565	3,507
1967	1,992	6,560	2,185	3,078	2,499	4,379	3,492	7,026	4,345	3,824
1968	2,034	7,078	2,419	2,626	2,015	3,288	4,124	7,006	4,368	3,708
1969	2,099	6,571	2,574	2,602	2,094	3,630	4,128	6,781	4,695	3,731
1970	1,978	6,798	3,089	2,392	2,011	3,671	6,044	6,614	4,643	4,128
1971	1,925	6,616	2,047	2,620	1,688	5,582	6,143	5,652	6,325	4,540
1972	1,201	6,587	4,292	2,729	2,291	3,961	5,134	6,627	6,077	4,516

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 10. Production of rootcrops by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY [a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	40,126	90,235	58,805	75,204	135,468	371,394	105,634	126,833	176,301	1,180,000
1955	40,823	91,774	59,818	76,488	137,751	377,638	107,444	128,986	179,278	1,200,000
1956	42,847	96,355	62,790	80,240	145,471	396,507	112,812	135,495	188,265	1,260,782
1957	43,906	98,734	64,337	82,224	149,074	406,344	115,603	138,855	192,923	1,292,000
1958	45,243	101,674	66,249	84,645	153,429	418,292	119,018	142,941	198,509	1,330,000
1959	42,099	90,440	72,174	92,968	158,278	415,943	120,681	148,616	198,325	1,339,524
1960	36,482	117,047	85,315	81,022	169,001	411,590	124,775	166,399	219,930	1,411,561
1961	32,842	113,712	89,201	117,493	116,179	466,361	97,732	218,252	193,492	1,445,264
1962	31,932	187,365	76,301	69,099	135,408	393,411	90,460	194,916	155,178	1,334,070
1963	45,086	207,919	68,615	71,029	159,632	389,196	81,249	141,149	196,500	1,360,375
1964	37,938	228,562	69,217	72,868	164,940	422,832	106,188	197,261	252,645	1,552,451
1965	36,986	231,984	75,985	70,577	177,820	383,605	103,782	189,296	266,692	1,536,727
1966	30,267	227,518	76,048	73,034	199,119	324,445	101,171	176,882	263,541	1,472,025
1967	30,239	220,344	75,453	77,537	183,829	313,996	88,973	186,188	191,011	1,367,570
1968	29,901	211,075	76,844	66,499	176,030	312,196	86,943	151,351	194,409	1,305,248
1969	29,259	203,127	77,298	64,398	216,337	311,144	86,898	161,110	188,527	1,338,107
1970	37,247	249,268	64,839	65,340	198,091	289,090	86,675	187,374	138,339	1,316,263
1971	29,084	194,638	24,512	66,847	205,710	295,643	63,933	180,496	159,947	1,220,810
1972	25,641	171,599	26,732	67,336	217,385	299,118	68,790	170,029	171,024	1,217,704

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 11. Harvest area of rootcrops by region, Philippines, 1954-1972

YEAR	ILOCOS	a/CAGAYAN VALLEY	a/CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
						hectares				
1954	9,640	24,290	14,010	17,110	31,770	80,320	25,690	30,470	34,580	267,860
1955	9,720	24,660	14,150	17,550	32,260	81,700	26,070	31,230	35,350	272,690
1956	9,970	25,320	14,560	17,980	33,080	83,840	26,750	32,030	36,280	279,910
1957	10,390	26,390	15,290	18,750	34,460	87,350	27,880	33,370	37,820	291,700
1958	10,680	27,090	15,720	19,280	35,400	89,700	28,690	34,280	38,860	299,700
1959	9,780	24,430	17,950	20,900	37,120	84,140	29,730	37,850	38,400	300,300
1960	7,890	27,010	15,840	19,430	33,390	91,760	26,690	37,480	29,980	289,070
1961	5,500	23,460	14,420	26,780	23,490	104,660	21,660	41,400	21,280	282,650
1962	5,160	23,100	13,170	14,400	26,500	96,360	22,750	38,470	21,430	261,340
1963	6,090	22,730	12,360	14,290	28,840	108,050	22,220	27,100	22,680	284,410
1964	5,080	22,070	12,090	14,260	29,800	119,040	22,500	38,150	24,930	287,920
1965	4,940	25,030	11,910	13,870	35,360	96,880	20,940	35,440	23,330	273,650
1966	3,450	25,790	12,030	12,280	35,760	86,070	23,360	35,110	29,000	262,850
1967	3,[illegible]	26,060	11,890	13,200	34,900	77,500	23,060	35,260	26,710	252,100
1968	3,210	25,970	12,360	11,150	34,320	77,480	23,210	34,560	28,100	250,360
1969	3,090	25,610	12,440	10,860	36,370	77,040	22,690	38,180	27,300	253,580
1970	3,680	27,051	10,740	10,490	35,150	83,760	17,660	40,470	23,350	252,360
1971	3,122	22,868	7,290	10,940	38,440	85,750	12,450	41,000	24,090	245,980
1972	3,930	21,450	8,400	12,770	44,270	91,940	14,290	37,870	24,530	258,480

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 12. Yield per hectare of rootcrops by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	4,162	3,718	4,107	4,395	4,264	4,624	4,112	4,163	5,038	4,405
1955	4,200	3,722	4,227	4,358	4,270	4,622	4,121	4,130	5,072	4,401
1956	4,208	3,806	4,283	4,463	4,318	4,729	4,217	4,230	4,189	4,504
1957	4,226	3,741	4,208	4,385	4,326	4,652	4,146	4,161	5,101	4,429
1958	4,236	3,753	4,214	4,390	4,334	4,663	4,148	4,170	5,108	4,438
1959	4,305	3,702	4,021	4,448	4,264	4,944	4,059	3,926	5,165	4,461
1960	4,624	4,335	5,386	4,170	5,061	4,486	4,746	4,440	7,336	4,883
1961	5,971	4,847	6,186	4,387	4,946	4,456	4,512	5,272	9,093	5,113
1962	6,182	8,111	5,794	4,799	5,110	4,083	3,976	5,067	7,241	5,105
1963	7,403	9,127	5,551	4,971	5,535	3,602	3,657	5,208	8,664	5,145
1964	7,468	10,356	5,725	5,110	5,535	3,552	4,719	5,171	10,134	5,392
1965	7,487	8,929	6,380	5,089	5,029	3,960	4,956	5,341	9,414	5,616
1966	8,773	8,822	6,322	5,947	5,568	3,770	4,331	5,038	9,088	5,600
1967	8,591	8,455	6,346	5,974	5,267	4,052	3,858	5,280	7,151	5,425
1968	9,315	8,128	6,217	5,964	5,129	4,029	3,746	4,379	6,918	5,213
1969	9,469	7,932	6,214	5,930	5,948	4,039	3,830	4,220	6,906	5,277
1970	10,097	9,215	6,037	6,229	5,636	3,451	4,908	4,630	5,925	5,216
1971	9,315	7,480	3,362	6,110	5,351	3,448	5,135	4,402	6,640	4,963
1972	8,750	7,085	3,182	5,273	4,910	3,253	4,814	4,491	6,975	4,711

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 13. Production of cacao and coffee by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY	CENTRAL LUZON[a]	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	118.6	386.5	79.1	2,933.9	239.1	313.7	399.2	1,866.4	1,163.9	7,500.0
1955	132.1	438.3	85.9	3,345.6	259.4	322.7	441.8	2,097.0	1,395.2	8,518.0
1956	128.9	448.4	91.0	3,383.8	255.6	343.4	444.6	2,154.8	1,349.5	8,600.0
1957	147.8	509.2	97.1	3,933.4	296.6	358.3	502.6	2,460.1	1,617.9	9,923.0
1958	162.4	578.8	109.0	4,515.7	332.1	390.6	560.4	2,815.3	1,835.7	11,300.0
1959	136.6	572.8	120.2	5,309.6	320.0	483.4	762.4	2,954.9	1,718.7	12,378.6
1960	158.5	1,264.7	204.9	8,322.5	801.4	788.9	3,190.5	7,327.0	6,835.9	28,934.3
1961	124.9	1,910.1	140.2	10,348.4	1,310.6	625.4	5,314.6	7,931.1	8,248.2	35,953.5
1962	138.5	2,537.9	203.3	9,809.3	622.0	1,435.6	4,895.9	19,306.4	7,401.3	46,350.1
1963	155.3	4,410.7	220.5	8,858.9	1,518.7	754.0	2,579.1	10,222.0	7,550.0	36,269.2
1964	109.5	7,120.0	151.0	8,983.1	1,430.7	903.2	2,584.2	14,462.1	7,072.6	42,816.4
1965	59.9	9,516.9	192.0	10,304.3	2,041.9	948.9	2,515.7	12,933.7	9,808.8	48,322.1
1966	61.3	9,539.2	215.6	8,900.9	2,937.3	658.2	2,634.3	9,416.1	12,440.9	46,803.8
1967	66.1	9,508.5	267.5	9,215.3	3,714.0	685.8	2,246.9	9,757.0	12,366.9	47,828.0
1968	65.6	6,940.0	275.5	8,813.6	3,122.5	690.8	2,288.6	9,768.7	16,050.0	48,015.3
1969	57.3	6,665.9	260.0	9,996.4	3,105.7	786.7	2,583.1	9,606.8	15,529.7	48,591.6
1970	935.1	6,258.2	366.9	12,958.8	3,839.3	933.5	2,486.6	9,530.4	16,004.7	53,313.5
1971	862.3	5,770.8	225.9	10,953.8	1,498.9	987.4	2,118.4	12,617.3	18,020.7	53,055.5
1972	958.3	6,413.5	298.9	12,065.8	1,330.3	866.2	2,154.4	12,664.4	18,316.5	55,068.3

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 14. Harvested area of cacao and coffee by region, Philippines, 1954-1972

YEAR	ILOCOS	CAGAYAN VALLEY[a]	CENTRAL LUZON[a]	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	430	1,700	330	7,460	1,070	1,290	2,280	5,390	4,230	24,200
1955	440	1,840	340	8,090	1,100	1,320	2,340	5,720	[illegible]	25,710
1956	440	1,870	350	8,290	1,130	1,320	2,380	5,330	4,610	26,220
1957	470	2,010	380	8,960	1,210	1,400	2,540	5,270	4,960	28,200
1958	510	2,150	400	9,720	1,300	1,490	2,740	6,810	5,380	30,500
1959	430	2,310	370	11,000	1,290	1,780	2,880	7,010	5,440	32,510
1960	450	1,990	510	12,140	1,280	1,970	4,870	7,300	6,570	37,080
1961	400	3,430	660	14,580	1,800	1,850	6,880	8,5[illegible]	[illegible],440	48,580
1962	400	3,440	780	14,010	1,540	2,670	6,760	13,330	10,480	59,410
1963	400	3,390	1,260	15,490	2,010	2,300	6,520	9,810	10,570	51,750
1964	360	3,040	1,190	16,090	2,150	2,240	6,570	10,160	9,340	51,140
1965	320	3,870	1,200	14,850	2,610	1,580	6,250	12,610	10,770	53,960
1966	160	3,740	1,590	15,310	2,700	1,690	6,650	12,510	11,010	55,120
1967	210	3,480	1,350	14,790	3,530	1,690	6,830	12,840	14,210	58,930
1968	300	3,050	1,560	13,780	4,690	1,860	6,580	12,860	13,670	58,550
1969	270	4,520	1,130	14,750	4,400	1,560	6,610	14,670	13,170	61,170
1970	309	4,841	1,100	[illegible]	4,[illegible]	1,900	5,950	13,450	13,840	62,360
1971	3[illegible]6	4,794	1,040	[illegible],050	4,120	1,940	5,430	13,420	14,[illegible]	61,690
1972	[illegible]	4,606	1,050	16,640	3,720	1,880	5,020	13,410	15,050	61,670

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 15. Yield per hectare of cacao and coffee by region, Philippines, 1954–1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY [a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	276	227	240	392	224	243	175	346	275	310
1955	300	238	253	414	236	244	189	367	309	331
1956	293	240	260	408	226	260	187	370	293	328
1957	314	253	256	439	245	256	198	392	326	352
1958	318	269	273	465	255	262	205	413	341	370
1959	318	248	325	483	248	272	265	422	316	380
1960	441	636	402	684	626	400	655	1,004	1,040	781
1961	312	557	212	710	728	338	772	929	790	740
1962	346	738	261	700	404	338	724	999	706	780
1963	388	1,301	175	572	756	328	396	1,042	714	701
1964	304	2,342	127	558	665	403	393	1,423	757	837
1965	272	2,459	161	694	782	601	402	1,026	911	896
1966	383	2,551	155	581	1,088	399	396	753	1,129	849
1967	315	2,732	198	623	1,052	406	329	760	870	812
1968	218	2,135	176	640	666	371	348	759	1,174	820
1969	212	1,475	230	678	692	504	391	655	1,179	794
1970	3,026	1,293	333	789	843	491	418	709	1,156	856
1971	2,817	1,204	217	682	364	509	390	940	1,235	860
1972	3,259	1,398	285	725	358	461	429	944	1,217	896

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 16. Production of vegetables (including onion and potato) by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	16,095	21,272	40,650	27,509	6,397	14,482	22,119	11,156	17,568	177,248
1955	17,741	21,026	49,926	27,717	6,237	13,866	21,391	9,214	16,297	183,405
1956	17,727	21,320	50,117	28,267	6,244	13,644	21,345	9,249	17,367	185,480
1957	17,698	21,817	49,328	28,511	6,303	13,982	21,557	9,379	18,625	187,200
1958	19,017	24,646	49,319	29,851	6,920	14,893	22,475	10,027	17,583	194,731
1959	18,536	29,054	45,934	29,285	7,344	14,944	22,275	9,874	13,161	190,306
1960	18,940	37,460	44,061	23,957	9,443	9,306	21,631	10,872	9,548	185,218
1961	19,122	39,350	49,317	16,191	11,821	6,250	14,760	10,072	8,065	174,948
1962	22,090	42,732	52,364	18,008	11,704	6,166	20,661	13,246	10,486	197,458
1963	20,046	47,948	34,217	16,596	15,914	4,647	23,542	7,480	11,807	182,197
1964	19,955	57,199	30,094	21,977	17,618	4,512	26,740	6,034	14,265	200,394
1965	24,218	46,953	38,351	26,970	22,464	3,008	26,006	7,627	21,335	215,962
1966	24,420	46,980	47,116	27,134	22,[illegible]17	4,230	26,526	6,534	19,018	224,775
1967	25,276	46,676	47,083	30,406	25,177	4,395	25,941	5,900	21,429	232,283
1968	21,677	39,283	47,405	32,417	28,467	5,082	27,995	5,922	20,083	228,431
1969	22,367	47,481	54,291	27,216	32,986	5,608	30,450	7,430	21,443	249,172
1970	25,209	46,934	98,749	27,856	35,115	5,935	30,172	10,432	23,368	305,770
1971	29,368	57,008	102,925	25,354	20,762	6,279	27,008	8,926	23,237	300,866
1972	31,125	60,419	102,536	20,781	18,024	9,363	19,357	10,221	22,725	295,150

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 17. Harvested area of vegetables (including onion and potato) by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	10,760	11,220	20,550	13,670	3,650	9,340	11,720	5,440	8,800	95,150
1955	11,760	11,560	23,070	13,860	3,500	9,010	11,390	4,800	8,960	97,910
1956	11,780	11,770	22,600	14,200	3,500	9,060	11,460	4,810	9,190	98,370
1957	12,000	12,050	22,940	14,460	3,560	9,220	11,690	4,900	9,440	100,260
1958	12,060	12,920	22,540	14,910	3,780	9,800	12,100	5,370	9,460	102,950
1959	11,890	13,230	20,690	14,910	3,960	9,790	11,470	5,540	7,800	99,280
1960	10,120	10,060	20,370	10,330	3,580	6,640	9,020	5,660	4,950	80,730
1961	8,170	6,330	21,250	3,850	3,370	3,430	5,340	4,590	2,790	59,120
1962	10,060	6,740	19,940	6,410	3,000	2,340	6,910	5,180	3,090	63,670
1963	9,530	6,760	14,150	6,800	3,630	2,200	5,830	2,890	3,270	55,060
1964	9,500	7,150	12,780	7,490	2,470	2,420	5,150	2,660	3,640	53,260
1965	10,600	6,330	11,800	8,100	2,460	2,320	4,940	2,060	4,540	53,150
1966	10,860	6,320	12,990	8,280	2,630	2,630	5,000	1,750	4,320	54,780
1967	11,370	6,200	12,410	8,830	2,780	2,660	4,960	1,730	4,290	55,230
1968	10,410	6,100	10,940	10,040	2,950	2,450	5,000	1,530	3,770	53,190
1969	10,810	7,440	11,590	9,810	3,470	2,910	4,870	1,810	3,770	56,480
1970	11,712	6,878	16,630	9,450	3,710	2,540	4,650	2,350	3,580	61,500
1971	12,619	7,411	18,950	4,530	2,570	2,860	2,410	2,150	3,560	57,060
1972	12,745	7,485	18,970	5,300	3,370	4,170	3,500	3,010	4,470	63,110

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 18. Yield per hectare of vegetables (including onion and potato by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY	CENTRAL LUZON[a]	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	1,496	1,896	1,978	2,012	1,753	1,550	1,887	2,051	1,996	1,863
1955	1,509	1,819	2,164	2,000	1,782	1,530	1,877	1,920	1,819	1,873
1956	1,505	1,811	2,218	1,991	1,784	1,528	1,865	1,923	1,890	1,886
1957	1,475	1,810	2,150	1,972	1,770	1,516	1,844	1,914	1,973	1,867
1958	1,577	1,908	2,188	2,002	1,831	1,520	1,856	1,867	1,859	1,892
1959	1,559	2,196	2,220	1,964	1,855	1,516	1,94[illegible]	1,782	1,687	1,917
1960	1,872	3,724	2,163	2,319	2,638	1,402	2,[illegible]	1,921	1,929	2,294
1961	2,341	6,216	2,321	3,670	3,508	1,822	2,[illegible]	2,194	2,891	2,959
1962	2,196	6,340	2,626	2,809	3,901	2,635	2,9[illegible]	2,557	3,394	3,101
1963	2,103	7,093	2,418	2,441	4,36[illegible]	2,[illegible]	[illegible]	2,588	3,611	3,309
1964	2,1[illegible]	8,000	2,355	2,934	7,135	1,8[illegible]	[illegible]	[illegible]	3,919	3,[illegible]
1965	2,2[illegible]5	7,264	3,250	3,330	9,132	1,2[illegible]	[illegible]	[illegible]02	4,699	4,065
1966	2,249	7,434	3,627	3,277	8,676	1,6[illegible]	[illegible]	[illegible]	4,402	4,103
1967	2,223	7,528	3,794	3,443	9,056	1,652	[illegible]	[illegible]	4,995	4,202
1968	2,082	6,456	4,333	3,229	9,650	2,07[illegible]	[illegible]	[illegible]07	5,327	4,295
1969	2,059	6,382	4,684	2,774	9,477	1,925	5,2[illegible]	4,105	5,688	4,412
1970	2,152	7,114	5,938	2,948	9,455	2,337	6,489	[illegible]	6,527	4,972
1971	2,[illegible]27	7,692	5,431	5,597	8,[illegible]	2,195	11,207	[illegible]	6,527	5,273
1972	2,442	8,072	5,405	3,921	5,348	2,248	5,559	3,3[illegible]	5,084	4,677

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, [illegible]on, [illegible], Quezon City.

Appendix Table 19. Production of beans and peas by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	2,999	6,164	5,219	4,279	664	2,767	11,013	1,747	4,148	39,000
1955	3,076	6,322	5,352	4,388	681	2,838	11,296	1,792	4,254	39,999
1956	3,230	6,650	5,620	4,608	715	2,980	11,861	1,881	4,466	41,999
1957	3,424	6,987	5,878	4,883	758	3,123	12,356	2,005	4,685	44,100
1958	3,706	7,570	6,375	5,285	820	3,386	13,410	2,168	5,079	47,800
1959	4,003	6,953	5,910	5,124	857	3,529	15,809	2,143	4,779	49,106
1960	3,139	5,128	7,330	3,440	711	2,551	14,577	2,051	3,354	42,282
1961	3,002	3,924	6,731	2,483	280	1,480	11,331	1,941	2,217	33,337
1962	2,161	3,067	7,220	2,272	588	1,154	12,737	1,967	1,888	33,053
1963	2,052	3,083	10,478	1,853	586	797	8,736	1,214	2,483	31,287
1964	2,161	3,200	6,288	1,658	570	741	9,164	1,172	2,461	27,415
1965	1,853	3,410	7,384	1,561	600	792	6,641	977	2,528	25,748
1966	1,582	3,347	6,428	1,560	560	1,182	5,962	862	2,534	24,018
1967	1,348	3,405	5,874	1,563	576	762	3,569	857	2,533	20,487
1968	1,217	4,060	7,085	1,134	576	711	4,395	576	2,214	21,968
1969	986	3,119	6,984	906	468	691	4,053	456	2,384	20,047
1970	1,226	3,001	5,846	1,452	419	1,152	6,687	466	2,753	23,001
1971	1,223	2,993	7,308	1,330	241	980	5,865	506	3,188	23,634
1972	1,152	2,821	7,087	2,254	128	1,187	4,782	365	3,848	23,625

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 20. Harvested area of beans and peas by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	5,360	7,700	9,830	7,790	1,210	5,090	21,530	2,620	4,970	66,100
1955	5,500	7,840	10,090	7,970	1,250	5,220	22,080	2,690	5,070	67,710
1956	5,690	8,110	10,400	8,230	1,280	5,400	22,840	2,780	5,240	69,970
1957	6,460	8,870	11,030	9,050	1,450	5,730	24,030	3,170	5,610	75,400
1958	7,040	9,580	11,810	9,800	1,580	6,140	25,670	3,450	6,030	81,100
1959	7,050	9,900	11,780	9,000	1,590	6,200	26,770	3,470	5,870	81,630
1960	5,650	8,480	13,590	6,450	1,640	4,960	30,000	2,990	4,440	78,200
1961	4,220	6,220	14,240	4,270	530	3,480	24,590	2,600	2,960	63,110
1962	4,110	5,780	13,310	4,710	950	3,370	29,760	2,430	2,670	67,140
1963	3,920	5,810	18,620	4,470	960	2,170	28,170	1,470	3,260	68,850
1964	4,480	6,670	11,790	3,950	920	1,240	27,380	1,400	3,230	61,060
1965	3,520	6,860	13,000	3,630	1,010	2,200	20,890	1,470	3,440	56,020
1966	3,240	5,790	11,480	3,600	940	3,150	21,850	1,390	3,450	54,890
1967	2,700	6,330	11,010	3,560	940	2,190	15,720	1,360	3,580	47,390
1968	2,390	5,690	11,410	3,020	940	2,260	18,530	800	3,190	48,230
1969	1,900	5,040	11,340	2,780	710	2,240	17,460	640	3,200	45,310
1970	2,278	5,072	11,160	3,100	650	2,050	21,530	740	3,400	49,980
1971	2,204	4,906	12,610	2,960	420	1,740	19,870	790	3,720	49,220
1972	2,130	4,740	11,450	3,350	360	1,860	15,530	770	4,390	44,580

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 21. Yield per hectare of beans and peas by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	559.6	800.5	530.9	549.3	548.8	543.7	511.5	666.8	834.5	590.0
1955	559.3	806.4	530.5	550.6	544.8	543.7	511.6	666.2	839.0	590.7
1956	557.7	818.5	540.4	559.9	558.6	551.9	519.3	676.7	852.3	600.3
1957	530.0	787.7	532.9	539.6	522.8	545.1	514.2	632.5	835.1	584.9
1958	526.4	790.2	539.8	539.3	519.2	551.5	522.4	628.5	842.3	589.4
1959	567.8	702.3	501.7	569.3	539.0	569.2	590.6	617.6	814.2	601.6
1960	555.6	604.7	539.4	533.4	433.5	514.4	485.9	686.0	755.4	540.7
1961	711.3	630.8	472.7	581.4	528.3	425.4	460.8	746.5	749.0	529.0
1962	525.8	530.6	542.4	482.5	618.9	342.5	428.0	793.1	707.1	492.3
1963	523.4	530.7	562.7	414.6	610.4	367.4	310.1	825.9	763.2	454.4
1964	482.5	479.9	533.3	419.8	619.6	597.6	334.7	837.1	761.9	448.9
1965	526.5	497.1	568.0	429.9	594.5	360.0	317.9	664.8	735.0	459.6
1966	488.4	578.0	539.9	433.2	596.1	375.1	375.2	620.1	734.6	437.6
1967	499.2	537.9	533.5	439.0	613.2	347.8	227.0	630.1	707.6	432.3
1968	509.1	713.6	680.9	375.6	612.6	314.4	237.2	720.0	694.0	455.5
1969	519.0	618.8	615.9	329.5	659.2	308.5	232.1	712.0	745.0	442.4
1970	338.0	592.0	523.8	468.3	644.6	562.0	310.6	629.7	809.8	460.2
1971	555.0	610.0	579.6	449.2	573.8	563.2	295.2	640.5	856.9	480.2
1972	541.0	595.0	618.9	672.8	355.5	638.2	307.9	474.0	876.5	529.9

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 22. Production of citrus by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	1,517.2	3,763.6	3,817.5	7,108.6	3,410.4	2,918.4	3,326.5	1,461.1	3,676.7	30,000.0
1955	1,593.1	3,951.6	4,008.2	7,463.0	3,581.0	3,064.4	3,442.8	1,534.3	3,760.5	31,500.0
1956	1,658.8	4,114.9	4,173.8	7,772.0	3,728.6	3,190.0	3,343.6	1,597.6	4,019.9	32,300.0
1957	1,737.8	4,309.2	4,373.2	8,106.1	3,904.0	3,339.4	2,661.9	1,679.4	4,196.0	34,300.0
1958	1,820.3	4,510.8	4,587.1	8,718.9	4,116.8	3,492.2	2,793.5	1,745.2	4,422.3	36,207.1
1959	1,637.1	4,411.9	4,351.3	9,909.7	4,253.7	3,299.5	2,935.5	1,626.2	4,391.9	37,016.8
1960	1,948.9	4,597.2	5,090.2	10,677.8	5,812.6	3,082.8	3,329.5	4,351.5	4,551.6	43,349.1
1961	2,451.8	4,291.7	5,536.6	20,386.8	5,850.2	2,479.7	3,942.6	3,077.8	[illegible]	53,890.3
1962	2,576.2	3,961.7	5,555.7	14,098.0	6,308.5	2,649.5	5,913.5	5,598.9	5,844.1	62,099.1
1963	2,436.9	3,904.5	6,110.6	24,151.5	6,817.1	2,512.4	5,671.4	5,771.2	[illegible]	72,124.7
1964	2,136.7	4,032.2	5,791.3	24,985.0	6,996.9	2,191.0	5,103.7	3,930.9	6,814.8	61,3[illegible].7
1965	1,019.1	4,969.3	6,554.5	24,918.3	9,620.8	3,035.2	6,097.6	5,401.0	9,204.6	70,821.2
1966	998.7	6,579.8	6,731.8	26,287.8	10,940.3	3,488.2	6,953.5	4,026.5	9,259.2	75,261.8
1967	991.4	8,940.8	6,594.4	26,395.1	10,530.6	3,490.0	6,160.3	3,990.8	9,406.5	78,499.9
1968	1,040.7	10,972.8	6,672.4	23,459.8	10,187.7	3,569.4	6,071.3	4,595.0	[illegible]	77,968.0
1969	993.0	10,658.8	4,803.0	16,908.2	9,919.9	3,743.4	8,146.8	5,978.8	14,450.5	74,604.4
1970	1,221.5	9,[illegible]	5,292.1	8,142.5	12,386.9	3,513.3	8,482.9	7,643.0	14,[illegible]	70,686.0
1971	1,32[illegible].4	10,618.1	4,424.3	5,058.8	9,741.8	3,190.9	7,72[illegible].3	5,847.9	14,[illegible].0	62,736.5
1972	820.3	6,[illegible].8	3,386.4	6,185.0	10,7[illegible].3	3,607.3	11,461.2	7,021.5	15,474.7	65,494.5

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 23. Harvested area of citrus by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	1,500	1,750	2,110	5,810	1,770	1,320	1,800	1,100	1,640	18,800
1955	1,520	2,060	2,130	6,030	1,840	1,410	1,830	1,120	1,760	19,700
1956	1,600	2,140	2,200	6,210	1,910	1,480	1,930	1,180	1,850	20,500
1957	1,670	2,240	2,310	6,480	2,000	1,530	2,020	1,230	1,920	21,400
1958	1,740	2,330	2,350	6,720	2,050	1,570	2,090	1,270	1,980	22,100
1959	1,440	2,220	2,370	7,140	2,110	1,360	2,150	1,290	1,850	21,990
1960	1,230	2,090	2,320	8,770	2,410	1,300	1,820	1,390	1,610	22,900
1961	1,200	2,200	3,030	11,720	2,010	1,170	2,000	1,020	2,430	27,780
1962	1,150	1,600	2,750	11,970	3,170	1,220	2,890	1,040	1,940	28,630
1963	1,140	1,770	3,540	12,060	3,240	1,180	2,840	1,100	2,180	29,070
1964	1,000	1,870	3,270	12,140	2,850	1,140	2,980	910	2,200	28,360
1965	930	2,010	3,420	12,090	3,200	890	2,770	970	2,220	28,600
1966	800	1,970	3,360	12,200	3,420	900	2,740	960	2,130	28,480
1967	780	2,240	3,440	12,090	3,400	900	2,700	880	2,220	28,650
1968	830	1,900	3,820	11,270	3,510	920	2,760	870	2,130	28,010
1969	830	1,890	3,260	8,950	3,530	870	2,590	820	2,450	25,150
1970	713	1,747	3,250	4,840	3,880	940	2,590	1,100	2,220	21,280
1971	722	1,768	3,130	3,300	3,670	960	2,210	700	2,420	18,880
1972	609	1,477	2,600	3,270	4,240	910	2,410	680	2,530	18,720

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 24. Yield per hectare of citrus by region, Philippines, 1954-1972

YEAR	ILOCOS a/	CAGAYAN VALLEY a/	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					Kilograms					
1954	1,011	2,151	1,809	1,224	1,927	2,211	1,232	1,528	2,242	1,596
1955	1,046	1,918	1,882	1,238	1,946	2,173	1,335	1,370	2,194	1,599
1956	1,037	1,923	1,897	1,252	1,954	2,156	1,318	1,354	2,173	1,600
1957	1,041	1,924	1,893	1,251	1,952	2,152	1,318	1,358	2,116	1,603
1958	1,046	1,936	1,893	1,298	2,008	2,224	1,337	1,374	2,234	1,638
1959	1,137	1,935	1,952	1,388	2,016	2,426	1,365	1,416	2,374	1,683
1960	1,584	2,243	2,194	1,218	2,412	2,371	1,429	3,059	2,831	1,893
1961	2,043	1,951	401	6,773	499	2,119	1,971	3,017	2,417	1,940
1962	2,240	2,170	2,020	7,602	527	2,172	1,908	2,883	3,012	2,169
1963	2,155	2,206	1,746	7,454	564	2,129	1,997	3,428	3,054	2,137
1964	2,137	2,156	1,771	8,767	576	1,922	1,940	3,550	2,825	2,164
1965	1,228	2,472	1,917	7,787	783	3,410	2,201	5,569	4,146	2,476
1966	1,248	3,340	2,004	7,686	897	3,876	2,538	4,194	4,345	2,643
1967	1,271	3,991	1,917	7,763	671	3,838	3,022	4,535	4,237	2,740
1968	1,254	3,775	1,747	6,684	904	3,880	2,925	5,282	4,225	2,769
1969	1,196	5,640	1,473	4,790	1,108	3,153	3,146	7,221	5,398	2,962
1970	1,712	5,656	1,628	2,099	2,559	3,325	3,275	6,948	6,451	3,322
1971	1,817	6,006	1,414	1,378	2,952	3,324	3,497	8,354	6,121	3,323
1972	1,360	4,514	1,302	1,459	3,297	4,063	4,756	10,326	6,116	3,499

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 25. Production of coconut by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand nuts					
1954	6,362	7,793	51,143	1,538,867	756,043	751,454	358,211	633,730	499,347	4,602,950
1955	7,353	9,010	59,127	1,779,081	874,060	868,754	414,126	732,653	577,293	5,321,457
1956	7,601	9,315	61,117	1,841,394	903,464	897,979	428,057	758,262	596,881	5,504,070
1957	7,846	9,533	66,077	1,988,602	978,300	972,450	463,360	819,015	645,817	5,951,000
1958	8,100	9,900	66,200	2,002,800	978,400	972,100	463,900	824,700	647,500	5,973,600
1959	14,039	17,855	71,027	2,041,492	983,398	972,593	451,036	849,305	640,618	6,041,363
1960	10,880	17,160	58,360	2,407,230	860,860	671,420	423,570	965,860	600,590	6,015,930
1961	16,253	21,937	127,634	1,822,248	751,479	748,479	422,200	1,418,465	866,047	6,194,742
1962	15,897	20,038	114,096	2,061,802	728,828	1,191,358	821,499	1,418,376	1,023,682	7,395,576
1963	11,235	24,737	112,740	2,011,631	831,531	1,037,143	894,746	1,311,754	1,468,895	7,704,412
1964	11,155	24,376	110,888	1,804,489	913,256	937,534	899,144	1,157,238	1,364,086	7,222,164
1965	8,457	20,068	16,288	1,386,349	924,124	1,395,094	617,383	945,528	1,738,564	7,051,855
1966	8,879	20,388	47,749	1,000,106	936,879	1,509,818	620,639	1,053,758	1,891,634	7,089,850
1967	14,269	19,465	48,021	1,327,911	881,397	1,660,795	679,946	1,092,319	2,201,088	7,925,211
1968	7,779	16,884	56,270	821,401	405,014	1,694,016	710,546	1,392,272	2,308,275	7,412,457
1969	5,664	12,933	48,470	745,036	466,580	1,863,428	724,374	1,375,115	2,002,454	7,244,055
1970	6,267	12,723	44,321	830,409	459,713	2,065,854	593,007	1,129,296	2,603,617	7,745,206
1971	6,428	13,052	27,358	767,119	291,669	1,839,802	706,341	1,274,214	2,887,769	7,813,952
1972	7,190	14,597	34,135	960,332	232,980	1,610,551	660,629	1,778,304	3,125,697	8,424,414

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 26. Harvested area of coconut by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	3,040	4,390	12,620	256,000	185,000	199,340	97,310	114,970	117,330	990,000
1955	3,040	4,390	12,620	256,000	185,000	199,340	97,310	114,970	117,330	990,000
1956	3,040	4,400	12,640	256,530	185,370	199,740	97,510	115,200	117,570	992,000
1957	3,040	4,400	12,640	256,530	185,370	199,740	97,510	115,200	117,570	992,000
1958	3,050	4,410	12,690	257,460	186,050	200,460	97,870	115,620	118,000	995,610
1959	3,290	4,380	19,050	250,880	192,940	188,420	95,190	124,620	127,330	1,006,100
1960	2,540	3,890	11,960	262,310	179,130	177,510	106,940	176,370	138,750	1,059,400
1961	2,910	4,320	17,780	285,090	155,590	215,840	119,390	225,670	173,290	1,199,880
1962	2,970	4,690	17,700	282,320	172,160	252,500	123,220	238,390	189,790	1,283,740
1963	3,140	4,750	17,460	277,260	181,080	264,670	125,950	266,180	251,820	1,392,310
1964	2,800	5,910	15,460	277,790	218,280	306,350	124,230	274,590	257,480	1,482,890
1965	3,000	5,900	9,450	273,190	232,190	389,810	127,420	272,300	291,500	1,604,740
1966	3,230	6,150	9,440	274,750	238,500	383,270	125,020	272,170	298,390	1,610,920
1967	4,000	6,170	9,320	264,500	353,690	428,770	129,870	293,120	330,710	1,820,150
1968	3,380	11,500	9,320	317,500	307,600	387,370	143,410	267,550	352,780	1,800,410
1969	3,390	10,000	8,620	319,330	268,320	385,300	143,810	325,880	380,830	1,845,480
1970	4,608	10,752	9,040	330,020	240,770	387,000	143,110	332,740	425,880	1,883,920
1971	2,526	5,894	9,140	358,060	255,960	409,650	142,990	379,160	485,110	2,048,490
1972	2,499	5,831	9,400	407,810	211,720	411,750	159,920	444,280	472,320	2,125,530

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 27. Yield per hectare of coconut by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					nuts					
1954	2,093	1,775	4,053	6,011	4,087	3,770	3,682	5,512	4,256	4,649
1955	2,419	2,052	4,685	6,950	4,725	4,356	4,256	6,373	4,920	5,375
1956	2,500	2,117	4,835	7,17[illegible]	4,374	4,496	4,390	6,582	5,077	5,548
1957	2,581	2,167	5,228	7,752	5,278	4,869	4,752	7,109	5,493	5,999
1958	2,656	2,245	5,217	7,779	5,259	4,849	4,740	7,133	5,487	6,000
1959	4,267	4,076	3,728	3,137	5,097	5,162	4,738	6,815	5,031	6,005
1960	4,283	4,411	4,880	3,177	4,606	3,782	3,961	5,476	4,329	5,679
1961	5,505	5,078	7,179	6,392	4,130	3,468	5,536	6,286	4,998	5,163
1962	5,353	4,272	6,446	7,303	4,353	4,718	6,667	5,950	5,394	5,761
1963	3,573	5,208	6,457	7,255	4,592	3,919	7,104	4,928	5,833	5,534
1964	3,904	4,125	7,173	6,496	4,164	3,060	7,238	4,214	5,298	4,870
1965	2,819	3,401	6,724	5,075	3,960	3,579	4,845	3,472	5,964	4,394
1966	2,740	3,315	5,058	3,640	3,928	3,939	4,964	3,872	6,339	4,401
1967	3,567	3,155	5,152	5,020	2,423	3,785	5,236	3,727	6,656	4,354
1968	2,305	1,468	6,038	2,587	1,317	4,373	4,955	5,204	6,543	4,117
1969	1,671	1,293	5,623	2,333	1,739	4,836	5,037	4,220	5,258	3,925
1970	1,360	1,133	4,903	2,516	1,909	5,338	4,144	3,394	6,113	4,111
1971	2,545	2,214	3,015	2,142	1,140	4,491	4,940	3,361	5,953	3,814
1972	2,877	2,503	3,631	2,355	1,100	3,911	4,131	4,003	6,618	3,963

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 28. Production of sugarcane by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY [a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	3,197	830	268,246	159,824	1,090	49,585	1,097,290	1,145	8,530	1,589,737
1955	4,383	996	299,678	143,949	1,308	54,679	1,030,021	1,374	10,236	1,546,625
1956	4,135	961	274,977	131,671	1,262	50,236	938,924	1,326	9,877	1,413,369
1957	4,321	1,090	262,351	125,481	1,450	48,284	891,892	1,570	11,340	1,347,778
1958	4,737	2,264	307,735	144,124	3,893	73,550	1,043,127	1,631	12,445	1,593,506
1959	3,012	2,349	282,749	149,670	4,038	87,761	1,262,596	1,692	12,991	1,806,778
1960	2,401	2,355	362,260	143,505	3,371	72,390	1,213,928	1,183	7,268	1,808,661
1961	1,680	1,702	294,893	142,958	1,360	74,679	1,189,768	743	1,311	1,709,094
1962	1,314	1,248	324,975	171,784	1,349	91,184	1,308,035	854	1,770	1,902,513
1963	1,212	5,127	416,645	176,704	3,479	90,515	1,333,854	538	2,035	2,030,109
1964	1,205	403	294,411	141,680	5,300	98,837	1,143,863	240	3,907	1,689,846
1965	988	8,896	395,682	175,453	6,428	82,173	1,360,643	1,075	3,475	2,034,813
1966	924	8,753	321,136	167,839	5,738	92,901	1,226,444	1,290	3,309	1,828,314
1967	926	4,348	339,433	186,041	5,804	128,996	1,358,332	426	3,135	2,027,440
1968	865	7,317	293,229	195,883	5,668	155,374	1,499,451	175	3,294	2,161,257
1969	907	2,522	307,406	198,028	6,441	152,728	1,494,975	167	3,294	2,166,506
1970	498	3,332	303,620	244,614	5,938	165,553	1,867,551	493	3,047	2,594,647
1971	372	2,492	229,718	232,476	4,976	128,938	1,507,370	494	2,454	2,109,290
1972	397	2,656	354,825	296,566	6,061	159,254	1,717,425	662	15,680	2,553,526

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 29. Harvested area of sugarcane by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	3,170	660	58,330	26,830	1,450	9,250	158,470	940	6,000	265,100
1955	3,840	800	61,820	27,410	1,750	9,910	153,730	1,100	7,210	267,700
1956	3,660	730	55,140	24,440	1,700	9,010	137,470	1,140	6,960	240,000
1957	3,120	820	53,470	23,690	1,800	9,920	133,630	1,200	7,350	234,700
1958	3,590	5,130	51,150	22,610	3,770	20,300	124,010	1,110	7,030	238,700
1959	3,200	5,270	51,900	24,630	3,870	22,190	133,340	1,140	7,220	252,160
1960	2,360	2,930	49,790	24,500	2,800	15,790	139,070	610	4,020	242,170
1961	1,560	2,700	50,260	24,190	1,810	14,570	136,350	470	820	232,230
1962	1,320	1,110	54,960	29,500	1,360	14,810	150,260	470	910	254,700
1963	750	1,480	56,940	25,970	2,240	14,020	156,110	330	930	258,770
1964	750	310	55,200	25,720	2,280	16,420	167,740	170	1,290	269,880
1965	620	2,530	57,360	27,950	2,540	27,130	200,820	370	1,160	350,480
1966	580	2,160	74,080	25,290	2,470	25,870	179,790	340	1,080	315,280
1967	580	2,050	70,460	27,840	2,450	22,620	181,230	220	1,040	308,690
1968	530	1,390	68,680	29,960	2,110	23,570	190,880	110	1,070	318,290
1969	560	850	66,920	36,350	2,520	27,760	206,810	70	1,120	342,960
1970	312	980	60,860	37,750	2,520	23,090	230,970	590	990	366,070
1971	298	942	75,580	44,940	2,000	29,120	287,470	590	680	441,620
1972	324	1,026	72,190	43,450	3,040	29,060	289,520	610	1,800	441,020

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 30. Yield per hectare of sugarcane by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	1,009	1,258	4,599	5,957	752	5,360	6,924	1,218	1,422	5,996
1955	1,141	1,245	4,748	5,258	947	5,510	6,696	1,164	1,420	5,777
1956	1,130	1,231	4,987	5,380	742	5,576	6,830	1,163	1,419	5,882
1957	1,131	1,329	4,707	5,297	806	5,415	6,674	1,308	1,543	5,743
1958	1,325	441	6,016	6,374	1,033	3,623	8,412	1,469	1,770	6,676
1959	941	446	5,448	6,223	1,043	3,955	9,470	1,404	1,785	7,165
1960	1,017	604	7,276	5,857	1,163	4,535	8,729	1,462	1,808	7,469
1961	1,077	630	5,867	5,910	1,038	5,126	8,726	1,581	1,599	7,360
1962	995	1,124	5,915	5,823	1,992	6,157	8,705	1,817	1,945	7,470
1963	1,616	3,464	7,317	6,804	1,053	6,456	8,544	1,631	2,188	7,845
1964	1,607	1,300	5,334	5,509	2,325	6,019	6,219	1,412	3,029	6,261
1965	1,594	3,516	4,529	6,277	2,531	3,029	6,775	2,905	3,996	5,806
1966	1,593	4,006	4,335	5,810	2,303	3,591	6,822	3,794	3,064	5,799
1967	1,508	1,333	4,817	6,682	2,369	5,702	7,495	1,935	3,015	6,568
1968	1,672	5,204	4,269	6,538	2,686	6,592	7,855	1,591	3,100	6,790
1969	1,620	2,967	4,594	5,448	2,550	5,502	7,229	2,386	2,975	6,317
1970	1,596	3,373	4,409	6,430	2,356	7,170	8,086	836	3,078	7,088
1971	1,251	2,644	3,039	5,173	2,488	4,428	5,244	837	3,609	4,776
1972	1,223	2,589	4,915	6,825	1,994	5,480	5,932	1,085	3,711	5,790

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 31. Production of abaca by region, Philippines, 1954-1972

YEAR	ILOCOS	CAGAYAN VALLEY	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	-	25.5	-	62.1	29,018.1	11,492.6	584.7	13,007.0	52,010.0	106,200.0
1955	-	25.0	-	60.7	28,553.4	11,309.0	575.3	12,799.4	51,180.2	104,503.0
1956	-	29.0	-	70.5	33,187.2	13,144.3	668.6	14,876.6	58,323.8	120,300.0
1957	-	31.0	-	75.3	35,449.0	14,040.3	714.2	15,890.6	62,299.3	128,499.7
1958	-	2.5	-	2.0	38,690.9	24,343.0	786.9	20,556.0	40,200.1	124,581.4
1959	-	2.2	-	1.8	34,613.4	21,777.7	704.0	18,389.7	35,963.7	111,452.5
1960	a/	a/	-	56.2	27,234.8	20,302.3	1,313.3	12,680.8	32,900.6	94,487.9
1961	a/	-	-	57.4	29,968.4	29,642.6	1,488.0	12,945.0	40,653.7	114,755.1
1962	-	-	-	41.9	20,517.7	35,587.0	2,404.4	14,917.4	42,821.1	116,289.5
1963	-	-	-	44.2	37,701.7	28,386.5	1,720.2	13,770.1	46,1[illegible].4	127,781.1
1964	-	-	-	57.6	35,393.9	40,114.2	1,296.3	20,125.8	37,2[illegible].8	134,284.6
1965	-	6.7	-	58.7	41,298.2	27,805.8	1,498.9	21,411.9	41,922.3	134,002.5
1966	-	6.7	-	59.8	42,413.4	19,938.0	1,746.3	20,198.1	50,888.2	135,250.5
1967	-	-	-	104.0	39,442.9	25,521.4	1,921.2	17,816.8	32,808.6	117,614.9
1968	-	133.6	-	444.1	35,296.0	25,918.3	1,932.1	16,926.9	22,785.4	103,435.4
1969	-	-	-	309.5	35,809.8	25,418.8	2,136.7	17,452.4	24,769.0	105,896.2
1970	-	-	-	126.0	45,226.0	33,224.0	1,889.3	17,404.2	24,510.8	122,380.3
1971	-	-	-	8.9	32,486.4	35,170.1	1,788.8	13,947.3	21,187.6	104,591.1
1972	-	-	-	54.4	36,648.7	32,697.3	3,552.1	17,845.2	19,299.6	110,097.3

a/ Less than 100 kilograms.
Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 32. Harvested area of abaca by region, Philippines, 1954-1972

YEAR	ILOCOS	CAGAYAN VALLEY	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	N. MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	-	70	-	300	81,820	22,250	1,880	22,390	109,920	238,630
1955	-	70	-	280	74,430	20,240	1,720	20,360	99,920	217,020
1956	-	70	-	280	74,350	20,220	1,720	20,340	99,820	216,800
1957	-	a/	-	300	79,390	21,590	1,840	21,720	106,590	231,500
1958	-	a/	-	a/	82,400	19,460	1,730	19,750	69,420	192,760
1959	-	a/	-	a/	81,590	19,020	3,760	24,410	63,760	192,540
1960	a/	-	-	160	73,700	19,000	3,700	21,150	57,510	175,220
1961	a/	-	-	140	69,980	35,980	3,120	18,590	46,810	174,620
1962	-	-	-	110	59,060	50,270	6,450	16,100	48,630	182,620
1963	-	-	-	100	74,310	39,490	3,990	14,680	49,330	181,900
1964	-	-	-	110	78,480	56,480	4,200	21,370	46,900	210,540
1965	-	10	-	110	80,020	39,270	3,960	26,670	49,300	199,290
1966	-	10	-	610	80,330	41,430	4,840	21,780	49,540	196,040
1967	-	-	-	290	77,970	42,080	4,670	18,980	42,320	186,110
1968	-	40	-	720	73,930	42,750	4,870	16,060	32,340	170,710
1969	-	-	-	740	74,300	43,470	4,870	17,580	32,180	172,940
1970	-	-	-	480	74,260	44,060	4,870	19,400	29,950	173,020
1971	-	-	-	20	60,100	47,990	4,750	17,660	24,770	155,290
1972	-	-	-	20	58,850	47,750	3,350	18,790	18,470	147,230

a/ Less than 10 hectares.
Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 33. Yield per hectare of abaca by region, Philippines, 1954-1972

YEAR	ILOCOS	CAGAYAN VALLEY	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954		364		207	355	517	311	581	473	445
1955		357		217	384	559	334	629	512	482
1956		414		252	446	650	389	731	584	555
1957		443		251	447	650	388	732	584	555
1958					469	1,251	455	1,041	579	646
1959				180	424	1,145	187	753	564	578
1960				351	369	1,069	355	600	572	539
1961				410	428	824	477	696	868	657
1962				381	347	708	373	824	881	637
1963				442	507	719	431	938	936	702
1964				524	449	686	309	900	795	638
1965		670		534	516	708	379	804	850	672
1966		670		98	528	481	402	927	1,027	682
1967				359	506	606	394	959	775	632
1968		3,315		617	477	606	397	1,054	775	606
1969				418	482	585	439	1,004	769	612
1970				263	609	754	388	897	818	707
1971				445	541	733	377	790	855	674
1972				1,813	623	719	1,060	950	1,045	758

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 34. Production of tobacco (Native and Virginia) by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					thousand kilograms					
1954	4,380.7	14,090.6	3,471.4	85.8	139.3	2,007.9	1,333.1	592.7	1,557.6	27,659.1
1955	11,274.9	11,003.9	3,146.9	68.2	110.2	1,545.6	1,177.3	422.2	1,366.0	30,137.2
1956	18,330.1	7,139.2	7,424.3	81.4	131.0	1,612.1	1,555.2	490.6	1,593.3	38,357.2
1957	27,027.3	7,720.4	9,876.3	93.2	154.5	1,736.6	1,869.3	530.3	1,869.3	50,899.2
195	28,043.9	7,075.3	8,666.9	84.1	143.8	1,593.1	1,717.5	465.6	1,765.8	49,600.0
[illegible]	25,549.4	[illegible],121.3	10,361.3	101.9	387.8	2,041.3	1,730.5	1,125.5	2,268.0	51,719.0
1960	28,410.0	11,032.3	12,337.8	314.9	174.0	2,180.6	2,513.2	2,645.3	3,687.1	63,997.2
1961	22,950.3	13,431.9	11,457.4	360.2	174.6	2,201.0	4,102.6	2,396.5	2,913.0	59,987.3
1962	25,360.0	1[illegible],090.5	11,204.2	329.4	160.0	2,319.5	3,474.4	2,763.8	5,440.1	69,670.9
1963	23,472.5	1[illegible],483.8	11,200.0	497.5	183.2	2,424.1	3,669.4	2,966.6	4,753.1	67,649.2
1964	19,920.2	19,275.4	10,747.3	595.0	182.0	2,532.5	3,650.1	2,255.7	3,882.8	65,041.0
1965	17,088.7	11,470.0	6,628.2	551.5	392.3	1,039.6	2,605.0	1,304.3	4,032.1	45,717.7
1966	14,261.3	24,220.8	5,651.6	1,287.6	167.3	1,876.2	3,535.7	1,427.9	3,690.6	8,122.0
1967	13,963.5	13,713.4	11,943.1	1,604.9	157.2	1,859.4	2,515.5	1,537.0	3,857.9	71,152.7
1968	17,065.9	21,570.4	12,454.2	1,640.9	147.0	1,749.4	2,527.5	1,433.1	6,231.3	64,852.6
1969	18,061.7	15,14[illegible]	9,641.6	1,352.6	196.1	1,687.4	2,520.3	1,412.4	6,860.6	56,852.5
1970	19,446.7	21,[illegible]67.4	7,054.8	1,154.3	240.5	1,678.2	2,650.3	1,295.0	5,618.3	61,206.0
1971	17,131.2	1[illegible],558.8	7,034.8	459.0	400.0	1,683.6	2,511.5	1,460.7	6,574.1	55,813.7
1972	17,886.1	1[illegible],376.5	7,063.6	662.8	564.9	1,331.5	802.0	1,507.0	7,113.3	56,312.7

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 35. Harvested area of tobacco (Native and Virginia) by region, Philippines, 1954-1972

YEAR	ILOCOS[a]	CAGAYAN VALLEY[a]	CENTRAL LUZON	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					hectares					
1954	10,530	20,700	6,830	210	530	2,620	2,450	1,080	3,050	48,200
1955	18,210	17,720	7,720	190	450	2,410	2,320	920	2,660	52,600
1956	30,580	18,760	15,140	250	470	3,180	3,030	960	2,730	75,100
1957	32,690	20,230	16,240	270	510	3,430	3,250	1,030	2,950	80,600
1958	42,180	17,070	15,370	240	430	2,890	2,970	860	2,790	84,800
1959	41,570	19,460	17,050	240	440	3,940	3,130	2,500	2,660	90,990
1960	44,390	20,420	16,550	590	410	4,170	3,020	3,030	2,350	95,830
1961	38,570	21,990	15,060	610	340	5,050	4,400	3,110	2,100	91,130
1962	41,930	24,040	15,320	590	340	5,190	3,960	4,200	4,100	100,470
1963	37,940	25,300	15,030	800	340	4,600	4,440	3,620	5,290	97,440
1964	32,130	27,490	14,790	840	370	4,720	5,680	5,600	5,900	95,520
1965	28,480	19,160	11,650	780	800	3,050	3,420	3,120	6,560	76,080
1966	24,380	31,370	11,730	1,500	340	3,670	3,200	2,250	7,230	85,670
1967	23,990	24,980	13,130	2,100	320	4,650	3,250	2,440	7,640	82,500
1968	28,660	32,040	14,670	2,030	310	3,620	3,330	2,120	6,710	93,550
1969	29,910	28,910	12,030	1,870	270	3,520	3,350	2,220	7,280	89,360
1970	26,354	26,556	8,630	1,500	380	3,440	3,540	2,100	6,870	79,410
1971	25,109	25,301	8,440	590	380	3,490	3,460	2,140	6,680	75,770
1972	26,952	27,150	8,610	680	240	3,490	1,650	2,140	6,720	77,640

[a] 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.

Appendix Table 36. Yield per hectare of tobacco (Native and Virginia) by region, Philippines, 1954-1972

YEAR	ILOCOS	CAGAYAN VALLEY a/	CENTRAL LUZON a/	SOUTHERN TAGALOG	BICOL	EASTERN VISAYAS	WESTERN VISAYAS	NE MINDANAO	SW MINDANAO	PHILIPPINES
					kilograms					
1954	416	681	508	409	263	712	544	549	511	574
1955	619	621	408	359	245	641	507	459	522	573
1956	599	381	490	326	279	507	513	511	584	511
1957	827	382	608	345	303	507	575	515	640	632
1958	665	414	564	350	334	551	578	565	642	585
1959	615	417	600	425	904	518	554	450	860	568
1960	640	570	745	534	668	523	832	673	1,569	668
1961	595	614	761	590	514	436	958	771	1,387	658
1962	605	729	731	558	529	548	877	656	1,327	635
1963	619	728	745	622	559	527	826	820	898	694
1964	620	701	727	708	492	557	995	627	658	681
1965	600	509	569	707	490	538	762	598	616	691
1966	585	772	738	858	492	511	809	635	510	678
1967	582	549	910	764	491	400	774	630	605	620
1968	596	674	749	608	477	463	759	657	929	693
1969	604	584	801	723	726	471	752	636	942	633
1970	735	796	817	770	633	482	749	617	963	700
1971	679	731	834	778	1,053	482	726	683	984	738
1972	661	716	820	975	2,354	382	486	704	1,059	725

a/ 1970-72 published BAEcon data were adjusted because of the change in the provincial composition of the region in 1970.

Source: Crop, Livestock and Natural Resources Statistics, BAEcon, DANR, Quezon City.