

POPULATION DISTRIBUTION IN THE PHILIPPINES  
(1960-1970)

by

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The importance of population as a variable in development planning is widely recognized as planners become aware of the relationship between the rate of economic growth and the rate of population growth. This awareness led to the initiation of population planning programs. Governments of practically all developing countries have become concerned with the search for solutions not only to the problem of meeting the needs of a rapidly increasing population but also in curbing the high rate of population growth.

The recognition of population dynamics as a field for program planning is not restricted to family planning as there is also the problem of population distribution. The problem of "rural-to-urban" and "depressed-to-more-progressive areas" movements of the population also gives rise to the problem of economic and geographical allocation of resources. The spread or concentration of the population within a country is of prime consideration in the allocation and utilization of manpower across the country.

In view of the importance of population distribution to social and economic planners, there is a need for information on this distribution among the regions and among the provinces within regions. Knowledge of these distributions could serve as a guide to our economic and social planners in determining the needs of the regions and in allocating available resources. It could also help them in guiding population movements to areas where there is less concentration.

This paper presents measures of population distribution in the Philippines based on the component regions and provinces.

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It also attempts to compare not only the population distribution on the two census years 1960 and 1970, but also the population concentration for the two periods.

### Measures of Population Concentration

Data of population distribution are usually given as number of persons per unit area, so-called population density. It may be given as "population per square kilometer", or "population per hectare". However, there are problems involved in the use of density. Duncan<sup>1</sup> gives three difficulties: (i) the dependence of density, to a great extent, on the system of areal units, for which densities are calculated, as "there is no way of assigning a unique meaning to the concept of density in the neighborhood of a point"; (ii) deciding on a suitable set of density intervals; and (iii) whether density figures are to be based on "net" rather than "gross" area gives rise to the problem of ascertaining the meaning of the concept of net area.

Aside from density, however, a useful information on population distribution is the extent of unevenness in the distribution. This has to do with the variation of density over the area under study. The Lorenz curve which is commonly used in studying income distribution may also be examined in measuring population concentration. Relative to this Lorenz curve, Gini's "concentration ratio" can be calculated.

The Lorenz curve for a population distribution<sup>2</sup> relates the cumulated areas ordered by decreasing density to the cumulated population within the areas. In constructing a Lorenz curve for a population distribution, two sets of percentages are cumulated. In one column, areas are arranged in order of decreasing density and cumulated percentages are taken in another column. In a third column, population of the ordered areas are listed and cumulated percentages are obtained (See Appendix Tables I-A and I-B). These two cumulated percentages are plotted, with the cumulated population percentages ( $P_i$ ) as the abscissae and the cumulated area percentages ( $A_i$ ) as the ordinates. If the population is "equitably" or evenly distributed over the whole area, the plotted curve would follow the diagonal line which represents the condition of perfect

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<sup>1</sup> Duncan, O.D. "The Measurement of Population Distribution" (1957). *Population Studies*, Vol. II, 1957-58, pp. 27-45.

<sup>2</sup> Ibid.

evenness of the distribution. On the other hand, if the distribution is completely uneven, the curve would coincide with the horizontal axis and the side of the square to the right of the diagonal. Variation between these two extremes of perfect evenness and perfect unevenness in the distribution is indicated by the extent of deviation of the curve from the diagonal. Geometrically, the concentration ratio is the area between this curve and the diagonal expressed as a proportion of the total area below the diagonal. It is given by the formula:

$$\text{Concentration ratio} = cr = \frac{n}{\sum_1^n P_i A_{i+1}} - \frac{n}{\sum_1^n P_{i+1} A_i} k ;$$

where  $A_i$  = the  $i$ th cumulated area expressed as percentage of total area;  
 $P_i$  = the  $i$ th cumulated population expressed as percentage of total population;  
 $n$  = the total number of small areas within the area under study  
 $k$  = a constant multiplier

Another measure of the degree of population concentration is the **index of concentration** which is sometimes called by demographers as the "index of dissimilarity". This is given by the formula:<sup>3</sup>

$$\text{Index of dissimilarity} = id = \frac{1}{2} \sum_{i=1}^n |p_i - a_i| ,$$

where  $a_i$  = the  $i$ th area expressed as percentage of the total area under study;  
 $p_i$  = the population of the  $i$ th area expressed as percentage of the total population.  
 $| |$  = denotes numerical value.

The index of dissimilarity may be interpreted as the proportion of the population that would need to be redistributed to attain a completely even distribution of population over the area. Relative to the Lorenz curve, the index of dissimilarity gives the maximum distance between the diagonal representing the

<sup>3</sup> The method is due to Edgar M. Hoover, Jr. "Interstate Redistribution of Population, 1850-1940", *Journal of Economic History*, Nov. 1941, pp. 199-205.

curve of completely even distribution and the curve of actual population distribution.

The change in population distribution over time may also be measured by using a similar formula:

$$id = \frac{1}{2} \sum_{i=1}^n |P_{oi} - P_{ti}| ,$$

where

$P_{oi}$  = the population of the  $i$ th area expressed as percentage over the total population in the base period

$P_{ti}$  = the population of the  $i$ th area expressed as percentage over the total population  $t$  years later

$n$  = number of subareas of the area under consideration

Using these methods described above, the distributions of the Philippine population over the regions and over the provinces within the regions are examined. The computations of the measures used are arranged in Tables I and II in the Appendix.

### Distribution of the Population Over the Regions

The spread of the Philippine population over the regions has not significantly changed since 1960. (See Fig. 1) The concentration ratio ( $cr$ ) increased only slightly from .223 in 1960 to .248 in 1970. This slight change in the  $cr$  may represent a balancing of two tendencies—that of regional deconcentration and urban concentration since these regions contain urban and non-urban areas.

Relative to the total Philippine population, the population of North Mindanao increased considerably from 1960. In 1960, its population constituted only 5.4 percent of the Philippine population, but in 1970 this share reached 13.4 percent. South Mindanao had 12.1 percent of the Philippine population in 1960 but this decreased to 8.2 percent in 1970, although the share of Mindanao of the Philippine population increased from 17.5 percent in 1960 to 21.5 percent in 1970. This implies that there

was a massive movement of people from South Mindanao to North Mindanao between 1960 and 1970.

Table I. Area and Population Proportions by Regions

REGION	Area (Proportions)	Population Proportions		Pop. Growth Rate per yr. (1960-1970)
		1960	1970	
Luzon	.46140	.53773	.53414	4.08
Manila	.00013	.04202	.03617	1.7
Central Luzon	.07964	.13621	.13863	3.5
South Tagalog	.15530	.15617	.18556	6.1
Bicol	.05938	.08719	.08015	2.6
Ilocos	.08676	.07791	.05337	3.4
Cagayan	.08009	.03823	.03976	4.1
Visayas	.19518	.28725	.24956	1.47
East Visayas	.12251	.16842	.14666	1.3
West Visayas	.07267	.11883	.10290	1.8
Mindanao	.34356	.17502	.21630	4.78
North Mindanao	.20930	.05424	.13447	5.1
South Mindanao	.34354	.12078	.08183	4.2
Philippines	100.0	100.0	100.0	3.57

The Visayas shared 28.7 percent of the Philippine population in 1960; this proportion decreased to 25 percent in 1970. Relative to the total Philippine population, population of both West and East Visayas decreased to 10.3 percent and 14.7 percent in 1970 from 11.9 percent and 16.8 percent in 1960 respectively. This decrease in proportional shares of the population is also reflected in the annual population growth rates of the region compared to those of the other regions in the Philippines.

Like the Visayas, Luzon decreased its share of the Philippine population from 53.8 percent in 1960 to 53.4 percent in 1970. Only Southern Tagalog region substantially increased its share of the Philippine population (See Table I). Even Manila's population decreased relative to the total Philippine population. There seems to have been movements of the population from Manila and Ilocos regions to provinces in the Southern Tagalog region.

It is significant to note that the proportions of the population of Luzon and the Visayas (relative to the total Philippine population) in both census years far exceed their areal proportions relative to total Philippine area, but Mindanao's share of the Philippine population is far below its share of area; that is, Mindanao is much less densely populated than both Luzon and the Visayas. In Luzon, only Cagayan Valley and the Ilocos Region have population proportions (relative to the total Philippine population) lower than their areal proportions (relative to total Philippine area). (Table I)

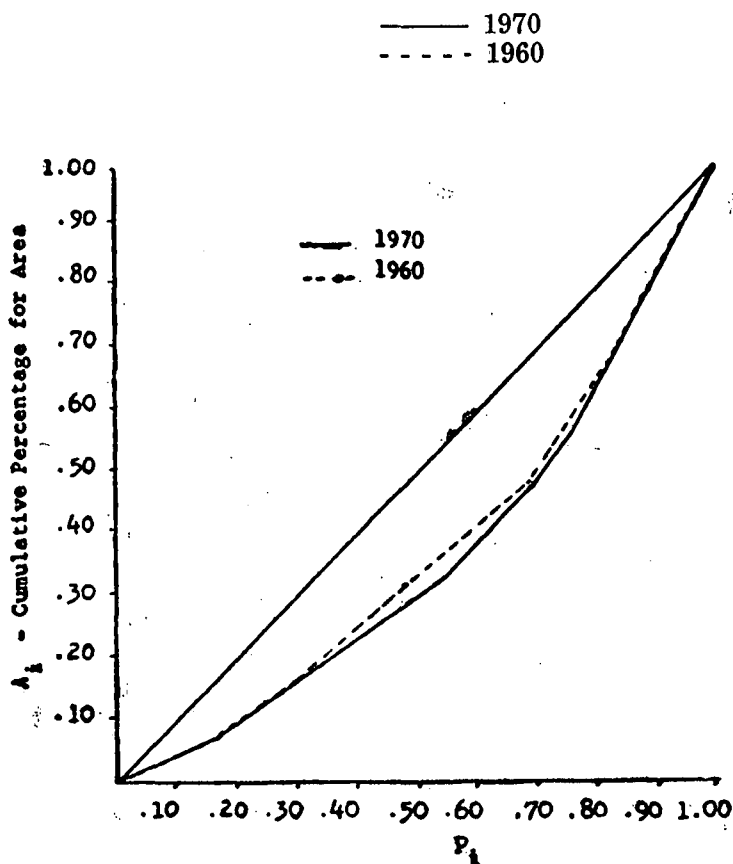


Fig. 1. (Population Distribution Among Regions: 1960 and 1970)

## Distribution of Population Over the Provinces

The population concentration ratio (cr) based on provinces is much higher than the cr based on regions. This is expected as "an index computed for a given set of areal units can be no larger than the index computed for a set which comprises subdivision's of the first set".<sup>4</sup> However, the big difference could mean the population is more unevenly distributed among the provinces than among the regions. The cr in 1960 remained almost the same in 1970. (See Fig. 2)

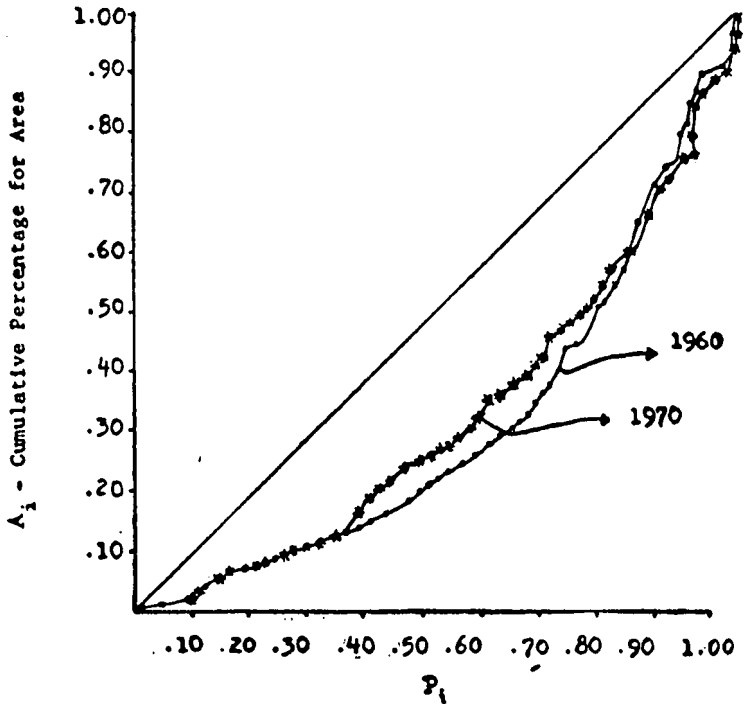
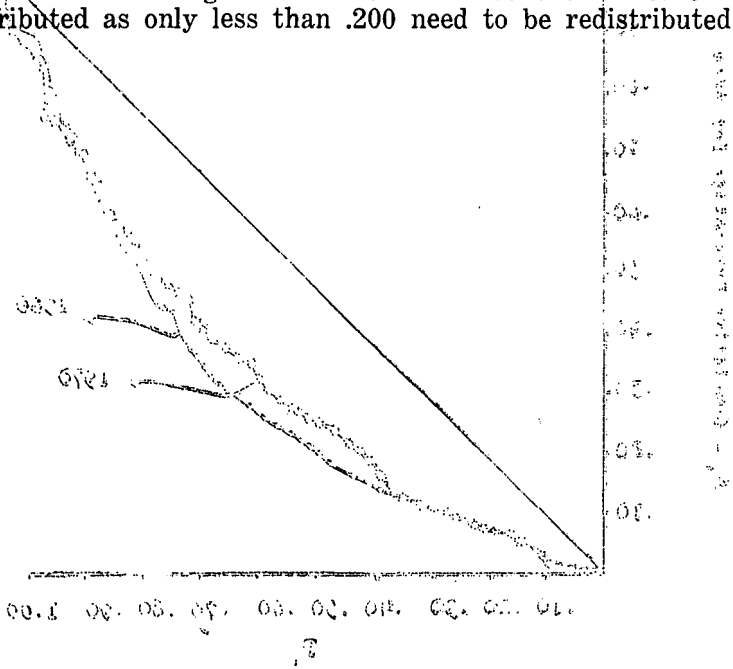


Fig. 2. (Population Distribution Among Provinces: 1960 and 1970)

<sup>4</sup> Duncan, O.D. (op. cit), p. 31

Rizal province, among the provinces, has the highest index of dissimilarity ( $\Delta$ ) of .609 in 1960 which remained the same in 1970. This represents the proportion of the population of the Rizal population that need to be redistributed to have an even distribution over the area. Bulacan, Abra, Ilocos Norte, Ilocos Sur, and Occidental Mindoro have each an index of dissimilarity of more than 0.400. As shown in Table 2, Antique, Romblon, Zamboanga del Sur, and Catanduanes had their population distributions "improved" in 1970 as their indexes of dissimilarity, which were above .200 in 1960, became less than .200 in 1970. This  $\Delta$  for Misamis Occidental increased from .186 in 1960 to .212 in 1970. Relative to the index of dissimilarity, the populations within Manila, Marinduque, Romblon, Catanduanes, Camarines Norte, Sorsogon, Albay, Leyte, Antique and Zamboanga del Sur seem to be the "most evenly" distributed as only less than .200 need to be redistributed.



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Table 2. Indexes of Dissimilarity by Provinces  
(1960-1970)

$\Delta^*$ Range	Provinces			
	1960		1970	
.600 and over	Rizal		Rizal	
.400 but less than .600	1. Ilocos Sur 2. Bulacan 3. Ilocos Norte 4. Lanao del Sur 5. Abra	6. Occ. Mindoro 7. Quezon 8. Zamboanga del Norte 9. Agusan	1. Ilocos Sur 2. Bulacan 3. Ilocos Norte 4. Lanao del Sur 5. Abra	6. Occ. Mindoro 7. Zamboanga del Norte 8. Quezon
.200 but less than .400	1. Batanes 2. Cavite 3. Bataan 4. La Union 5. Laguna 6. Aklan 7. Catanduanes 8. Pampanga 9. Antique 10. Capiz 11. Sulu 12. Tarlac 13. Batangas 14. Zambales 15. Misamis Or. 16. Nueva Viscaya 17. Masbate 18. Oriental Mindoro 19. Cebu 20. Camarines Sur	21. Nueva Ecija 22. Pangasinan 23. Negros Or. 24. Surigao 25. Negros Occ. 26. Leyte 27. Bukidnon 28. Cagayan 29. Zambo. del Sur 30. Isabela 31. Samar 32. Mt. Province 33. Palawan 34. Davao 35. Cotabato 36. Iloilo 37. Occ. Mindoro 38. Lanao del Norte	1. Batanes 2. Cavite 3. Bataan 4. La Union 5. Laguna 6. Aklan 7. Pampanga 8. Capiz 9. Sulu 10. Tarlac 11. Lanao del Norte 12. Batangas 13. Zambales 14. Misamis Or. 15. Nueva Viscaya 16. Masbate 17. Bohol 18. Or. Mindoro 19. Cebu 20. Camarines Sur 21. Nueva Ecija 22. Iloilo 23. Pangasinan 24. Negros Or. 25. Zamboanga del Norte	26. Surigao del Sur 27. Surigao del Norte 28. Negros Occ. 29. Bukidnon 30. Cagayan 31. Isabela 32. Agusan del Norte 33. Agusan del Sur 34. West Samar 35. East Samar 36. North Samar 37. Mt. Province 38. Palawan 39. Davao Or. 40. Davao del Sur 41. Davao del Norte 42. Cotabato del Sur 43. Cotabato del Norte 44. Misamis Occ.
Less than .200	1. Manila 2. Marinduque 3. Camarines Norte	4. Sorsogon 5. Albay 6. Bohol 7. Misamis Occ.	1. Manila 2. Marinduque 3. Romblon 4. Catanduanes 5. Camarines Norte 6. Sorsogon	7. Albay 8. Leyte del Sur 9. Leyte del Norte 10. Zamboanga del Sur 11. Antique
Philippines	$\Delta = .33865$ (1960)		$\Delta = .32327$	

\* Computation is based on  $\frac{1}{2} \sum |p_i - a_i|$  where  $i$  runs over the municipalities within each province.

Many provinces have considerably increased their population per hectare since 1960. Abra, Palawan and Rizal have more than double their densities from 1960. In 1960 Abra's population density increased from .29 to a hectare to .71 per hectare in 1970; Palawan's increased from .11 per hectare in 1960 to .60 per hectare in 1970; Rizal's population density increased from 7.83 per hectare in 1960 to 15.30 per hectare in 1970. In Rizal, Pasig, San Juan, Makati and Mandaluyong, had their population densities increased by more than 100 percent from 1960. Except for San Juan, all these municipalities had their population proportions relative to the total Rizal population increased from 1960. The provinces that have increased their population densities by at least 50 percent are: Bataan, Nueva Vizcaya, Zambales, Isabela, Bulacan and Occ. Mindoro. Manila too has increased its population density by more than 50 percent — from 297.4 per hectare in 1960 to 347.65 per hectare in 1970.

In all the provinces, there is, as expected, thick population concentration in the urban areas; the population densities in the provincial capitals and cities are considerably higher than those in the towns. Thus, relative to the total population of the province, the populations in these places constitute a very big portion.

### Distribution of Population Within Regions

Except for the Ilocos Region, Eastern Visayas and Northern Mindanao, the measures of population concentration ( $cr$ ) for the regions decreased from 1960 to 1970. These could mean that there were movements within the other regions possibly towards urban areas within the regions. It is to be noted though that the Ilocos Region whose  $cr$  increased slightly had on the other hand, its index of dissimilarity decreased by about the same amount (See Table 3). This observation seems to point to an inconsistency, but Duncan points out that the value of the index of dissimilarity ( $id$ ) is, in general, directly related to the number of units into which the area under consideration is directed, or inversely related to the average size of the units composing the area. A possible explanation of the increase in  $cr$  with a decrease in  $id$  is that there could be uneven concentrations in various urban areas within the region but some of these are "compensating".

Table 3. Measures of Concentration (cr) and Indexes of Dissimilarity ( $\Delta$ ) by Regions (1960, 1970)

Regions	CR		$\Delta$	
	1960	1970	1960	1970
Manila (I)	—	—	—	—
Ilocos Region (II)	0.370	0.401	0.335	0.301
Cagayan Valley (III)	0.063	0.024	0.223	0.024
Central Luzon (IV)	0.239	0.236	0.190	0.181
Southern Tagalog (V)	0.812	0.685	0.252	0.556
Bicol Region (VI)	0.432	0.161	0.147	0.126
Western Visayas (VII)	0.118	0.116	0.102	0.092
Eastern Visayas (VIII)	0.268	0.281	0.089	0.207
North Mindanao (IX)	0.144	0.194	0.133	0.157
South Mindanao (X)	0.347	0.334	0.290	0.265
Philippines	0.223	0.248	0.339	0.323

On the other hand, Southern Tagalog had its measure of population concentration decreased from .812 in 1960 to .685 in 1970 but its index of dissimilarity increased from .252 in 1960 to 0.556 in 1970. The decrease in cr could mean the spread of the population over the region with the opening up of areas within the region for intensive occupancy. But the increase in the index of dissimilarity could indicate that there is an "excess" of population in some urban areas of the region which need to be redistributed.

APPENDIX TABLE I-A  
POPULATION DISTRIBUTION BY REGIONS, PHILIPPINES  
(1960)

(1960) R e g i o n s	Density Pop/Ha.	Area in Ha.	Population	Cumulated Area	Cumulated Pop.	(Prop.) Cumulated A <sub>i</sub>	(Prop.) Cumulated P <sub>i</sub>	P <sub>i</sub> A <sub>i+1</sub>	P <sub>i+1</sub> A <sub>i</sub>
(I) Manila	297.443	3,828	1,138,611	3,828	1,138,611	.00013	.04202	.00335	.00002
(IV) Central Luzon	1.561	2,364,603	3,690,996	2,368,431	4,829,607	.07977	.17823	.02717	.02370
(VII) West Visayas	1.492	2,157,904	3,220,144	4,526,335	8,049,751	.15244	.29706	.06293	.05858
(VI) Bicol Region	1.340	1,763,249	2,362,707	6,289,584	10,412,458	.21183	.38425	.12848	.11707
(VIII) East Visayas	1.254	3,638,311	4,563,768	9,927,895	14,976,226	.33436	.55267	.27063	.23701
(V) Southern Tagalog	.918	4,611,893	4,231,973	14,539,788	19,208,199	.48968	.70884	.40862	.37367
(II) Ilocos Region	.570	2,576,569	1,469,753	17,116,357	20,677,952	.57646	.76308	.54226	.54226
(X) South Mindanao	.530	3,986,483	2,111,291	21,102,840	22,789,243	.71062	.84099	.77364	.68345
(IX) North Mindanao	.527	6,215,402	3,272,873	27,318,242	26,062,116	.91992	.96177	.96177	.91992
(III) Cagayan Valley	.436	2,378,040	1,035,748	29,696,282	27,097,864	1.00000	1.00000	—	—
		29,696,828	27,097,864					$\Sigma P_i A_{i+1} =$	$\Sigma P_{i+1} A_i =$
								3.17885	2.95568
								$\Sigma P_i A_{i+1} - \Sigma P_{i+1} A_i =$	$3.17885 - 2.95568$
									$= .22317$

APPENDIX TABLE I-B  
POPULATION DISTRIBUTION BY REGIONS, PHILIPPINES  
(1970)

(1970) R e g i o n s	Density Pop/Ha.	Area in Ha.	Population	Cumulated Area	Cumulated Pop.	(Prop.) Cumulated A <sub>i</sub>	(Prop.) Cumulated P <sub>i</sub>	P <sub>i</sub> A <sub>i+1</sub>	P <sub>i+1</sub> A <sub>i</sub>
(I) Manila	347.647	3,828	1,330,788	3,828	1,330,788	.00013	.03617	.00288	.00002
(IV) Central Luzon	2.156	2,364,603	5,100,098	2,368,431	6,430,886	.07975	.17480	.02664	.02215
(VII) West Visayas	1.754	2,157,904	3,785,408	4,526,335	10,216,294	.15242	.27770	.05882	.05462
(VI) Bicol Region	1.683	1,763,249	2,966,879	6,289,584	13,183,173	.21180	.35835	.11980	.10696
(VIII) East Visayas	1.483	3,638,311	5,139,731	9,927,895	18,578,904	.33431	.50501	.24726	.23086
(V) Southern Tagalog	1.480	4,611,893	6,826,553	14,539,788	25,405,357	.48961	.69057	.48265	.40395
(IX) North Mindanao	.796	6,215,402	4,947,067	20,755,190	30,352,424	.69891	.82504	.64821	.61393
(II) Ilocos Region	.764	2,576,569	1,963,414	23,331,759	32,315,838	.78567	.87841	.80806	.75443
(X) South Mindanao	.755	3,986,483	3,010,379	27,318,242	35,326,217	.91991	.96024	.96024	.91991
(III) Cagayan Region	.615	2,378,040	1,462,723	29,696,282	36,788,940	1.00000	1.00000	—	—
		29,696,282	36,788,940					$\Sigma P_i A_{i+1} =$	$\Sigma P_{i+1} A_i =$
								3.35456	3.10683
								$\Sigma P_i A_{i+1} - \Sigma P_{i+1} A_i =$	$3.35456 - 3.10683$
									$= .24773$

APPENDIX TABLE II-A.  
COMPUTATIONS OF THE MEASURES OF POPULATION  
CONCENTRATION WITHIN REGIONS  
(1960)

Provinces By Region	Density Pop'n Hectare	Pop'n	Area	C u m u l a t e d					
				Pop'n	Area	P <sub>i</sub>	A <sub>i</sub>	P <sub>i</sub> A <sub>i</sub> + <sub>i</sub>	P <sub>i</sub> + <sub>i</sub> A <sub>i</sub>
I. Manila	297.44279	1,138,611	3,828	1,138,611	3,828				
II. Ilocos Region	.57043	1,469,753	2,576,569						
1. La Union	1.96458	293,330	149,309	293,330	149,309	.1996	.0579	.03156	.02481
2. Ilocos Sur	1.31052	338,058	257,958	631,388	407,267	.4296	.1581	.12458	.09883
3. Ilocos Norte	.84526	287,333	339,934	918,721	747,201	.6251	.2900	.52865	.26726
4. Mt. Province	.30440	435,839	1,431,813	1,354,560	2,179,014	.9216	.8457	.92160	.84570
5. Abra	.23975	115,193	397,555	1,469,753	2,576,569	1.0000	1.0000		
						Cr = 0.36973 = 1.60639 — 1.23666			
III. Cagayan Valley	.43554	1,035,748	2,378,040						
1. Cagayan	.49462	445,289	900,267	445,289	900,267	.4299	.3784	.16646	.16646
2. Batanes	.49249	10,307	20,928	455,596	921,195	.4399	.3872	.36771	.33559
3. Isabela	.44151	442,062	1,066,456	897,658	1,988,651	.8667	.8359	.86670	.83590
4. Nueva Viscaya	.35372	138,090	390,389	1,035,748	2,379,040	1.0000	1.0000		
						Cr = 0.06292 = 1.40087 — 1.33795			
IV. Central Luzon	1.56094	3,690,996	2,364,603						
1. Pampanga	2.83058	617,259	218,068	617,259	218,068	.1672	.0922	.05337	.04350
2. Pangasinan	2.09409	1,124,144	536,818	1,741,403	754,886	.4718	.3192	.20391	.19867
3. Bulacan	2.08014	555,819	267,203	2,297,222	1,022,089	.6225	.4322	.34942	.31896
4. Tarlac	1.39726	426,647	305,345	2,723,869	1,327,434	.7330	.5614	.57918	.50683
5. Nueva Ecija	1.15126	603,362	528,433	3,332,231	1,855,867	.9028	.7848	.76097	.73944
6. Bataan	1.05846	145,323	137,296	3,477,554	1,993,163	.9422	.8429	.94220	.84290
7. Zambales	.57463	213,442	371,440	3,690,996	2,364,603	1.0000	1.0000		
						Cr = 0.23875 = 2.88905 — 2.65030			
V. Southern Tagalog	.91762	4,231,973	4,611,893						
1. Rizal	7.83155	1,456,362	185,961	1,456,362	185,961	.3441	.0403	.02347	.07147
2. Cavite	2.93638	378,138	128,755	1,834,500	314,716	.4335	.0682	.04612	.03717
3. Laguna	2.68259	472,064	175,973	2,306,564	490,689	.5450	.1064	.09538	.01669
4. Batangas	2.15242	631,414	316,581	2,987,978	807,270	.7060	.1750	.13823	.02707
5. Marinduque	1.19454	114,586	95,925	3,102,564	903,195	.7331	.1958	.33349	.15170
6. Quezon	.54698	653,426	1,194,615	3,755,990	2,997,810	.8875	.4549	.48768	.26798
7. Oriental Mindoro	.52466	228,998	436,472	3,984,988	2,534,282	.9416	.5495	.63746	.43156
8. Occidental Mindoro	.14340	84,316	587,985	4,069,304	3,122,267	.9616	.6770	.96160	.96160
9. Palawan	.10920	162,669	1,489,626	4,231,973	4,611,893	1.0000	1.0000		
						Cr = 0.81219 = 2.72343 — 1.91124			
VI. Bicol Region	1.33997	2,362,707	1,763,249						
1. Albay	2.01750	514,980	255,257	514,980	255,257	.2180	.1448	.05803	.01545
2. Sorsogon	1.62401	347,771	214,144	862,751	469,401	.3652	.2662	.20630	.11654

Provinces By Region	Density Pop'n Hectare	C u m u l a t e d							
		Pop'n	Area	Pop'n	Area	P <sub>i</sub>	A <sub>i</sub>	P <sub>i</sub> A <sub>i+1</sub>	P <sub>i+1</sub> A <sub>i</sub>
3. Camarines Sur	1.55609	819,565	526,682	1,682,316	996,083	.7120	.5649	.46323	.30138
4. Camarines Norte	.89080	188,091	211,249	2,026,736	1,358,480	.8578	.7704	.85780	.85780
5. Catanduanes	1.03428	156,329	151,148	1,838,645	1,147,231	.7782	.6506	.59972	.46187
6. Masbate	.83003	335,971	404,769	2,362,707	1,763,249	1.0000	1.0000		
								Cr = 0.43184	= 2.18488 — 1.75304
VII. Western Visayas	1.49225	3,220,144	2,157,904						
1. Iloilo	1.81528	966,266	532,397	966,266	532,397	.3007	.2467	.18463	.17688
2. Negros Occidental	1.69378	1,342,504	792,607	2,308,770	1,325,004	.7170	.6140	.50068	.48334
3. Aklan	1.24448	226,232	181,789	2,535,002	1,506,793	.7872	.6983	.64574	.61806
4. Capiz	1.19658	315,079	263,317	2,850,081	1,770,110	.8851	.8203	.78163	.75960
5. Romblon	.97098	131,658	135,593	2,981,739	1,905,703	.9260	.8831	.92600	.88310
6. Antique	.94530	238,405	252,201	3,220,144	2,157,904	1.0000	1.0000		
								Cr = 0.11770	= 3.03868 — 2.92098
VIII. Eastern Visayas	1.25486	4,563,768	3,638,311						
1. Cebu	2.61939	1,332,847	508,839	1,332,847	508,839	.2920	.1398	.10506	.07676
2. Leyte	1.46565	1,172,972	800,306	2,505,819	1,309,145	.5491	.3598	.25972	.24423
3. Bohol	1.43832	592,194	411,726	3,098,013	1,720,871	.6788	.4730	.42825	.38304
4. Negros Oriental	1.03936	597,761	574,577	3,695,774	2,295,448	.8098	.6309	.80980	.63090
5. Samar	.64638	867,994	1,342,863	4,563,768	3,638,311	1.0000	1.0000		
								Cr = 0.26790	= 1.60283 — 1.33493
IX. North Mindanao	.52657	3,272,873	6,215,402						
1. Sulu	1.21621	326,898	268,784	326,898	268,784	.0999	.0432	.01939	.01411
2. Zamboanga del Sur	.79154	742,404	937,920	1,069,302	1,206,704	.3267	.1941	.16681	.11638
3. Davao	.45396	893,023	1,967,183	1,962,325	3,173,887	.5996	.5106	.53574	.46669
4. Cotabato	.43246	1,029,119	2,379,705	2,991,444	5,553,592	.9140	.8935	.91400	.89350
5. Zamboanga del Norte	.42524	281,429	661,810	3,272,873	6,215,402	1.0000	1.0000		
								Cr = 0.14425	= 1.63594 — 1.49169
X. South Mindanao	.52961	2,111,291	3,986,483						
1. Misamis Occidental	1.28071	248,371	193,932	248,371	193,932	.1176	.0486	.01693	.01466
2. Misamis Oriental	1.02272	388,615	379,983	636,986	573,915	.3017	.1440	.07274	.06925
3. Lanao del Sur	.97686	378,327	387,289	1,015,313	961,204	.4809	.2411	.15350	.14685
4. Lanao del Norte	.86953	270,603	311,204	1,285,916	1,272,408	.6091	.3192	.30583	.24885
5. Surigao	.49374	359,997	729,118	1,645,913	2,001,526	.7796	.5021	.61744	.45586
6. Agusan	.23452	271,010	1,155,579	1,916,923	3,157,105	.9079	.7920	.90790	.79200
7. Bukidnon	.23435	194,368	829,378	2,111,291	3,986,483	1.0000	1.0000		
								Cr = 0.34687	= 2.07434 — 1.72747

APPENDIX TABLE II-B.  
COMPUTATIONS OF THE MEASURES OF POPULATION  
CONCENTRATIONS WITHIN REGIONS  
(1960)

Provinces By Region	Density Pop'n Hectare	C u m u l a t e d							
		Pop'n	Area	Pop'n	Area	P <sub>i</sub>	A <sub>i</sub>	P <sub>i</sub> A <sub>i+1</sub>	P <sub>i+1</sub> A <sub>i</sub>
I. Manila	347.64576	1,330,788	3,828						
II. Ilocos Region	.76393	1,963,414	2,576,569						
1. La Union	2.50274	373,682	149,309	373,682	149,309	.1898	.0579	.03001	.02232
2. Ilocos Sur	1.49302	385,139	257,958	758,821	407,267	.3855	.1581	.11180	.08711
3. Ilocos Norte	1.01027	343,427	339,934	1,102,248	747,201	.5510	.2900	.21660	.20120
4. Benguet	.99251	263,550	265,538	1,365,798	1,012,739	.6938	.3931	.37979	.32883
5. Abra	.70605	280,768	397,555	1,646,566	1,410,294	.8365	.5474	.52599	.48379
6. Mt. Province	.44395	93,112	209,733	1,739,678	1,620,027	.8838	.6288	.64208	.58529
7. Ifugao	.36733	92,487	251,778	1,832,165	1,871,805	.9303	.7265	.93080	.72650
8. Kalinga-Apayao	.19332	136,249	704,764	1,968,414	2,576,569	1.0000	1.0000		
						Cr = 0.40103 = 2.83707 — 2.43504			
III. Cagayan Region	.61509	1,462,723	2,378,040						
1. Cagayan	.64562	581,237	900,267	581,237	900,267	.3974	.3786	.32865	.31821
2. Isabe'a	.60773	648,123	1,066,456	1,229,360	1,966,723	.8405	.8270	.83310	.82055
3. Nueva Viscaya	.56857	221,965	390,389	1,451,325	2,357,112	.9922	.9912	.99220	.99120
4. Batanes	.54462	11,398	20,928	1,462,723	2,378,040	1.0000	1.0000		
						Cr = 0.02399 = 2.5395 — 2.12996			
IV. Central Luzon	2.15635	5,100,098	2,354,603						
1. Pampanga	4.16051	907,275	213,068	907,275	213,068	.1779	.0903	.03620	.03087
2. Bu'acan	3.11160	836,431	267,203	1,743,706	480,271	.3419	.2035	.14736	.12599
3. Pangasinan	2.58214	1,386,142	536,818	3,129,848	1,017,089	.6137	.4310	.34392	.31178
4. Tarlac	1.83303	559,708	305,345	3,689,556	1,322,434	.7234	.5604	.56743	.49892
5. Nueva Ecija	1.61097	851,294	528,433	4,540,850	1,850,869	.8903	.7844	.75017	.73161
6. Bataan	1.57477	216,210	137,296	4,757,060	1,988,163	.9327	.8426	.93270	.84260
7. Zambales	.92353	343,038	371,440	5,100,098	2,359,603	1.0000	1.0000		
						Cr = 0.23601 = 2.77778 — 2.54177			
V. Southern Tagalog	1.48018	6,826,455	4,611,893						
1. Rizal	15.29723	2,844,689	185,961	2,844,689	185,961	.4167	.0403	.02842	.01986
2. Cavite	4.04007	520,180	128,755	3,364,869	314,716	.4929	.0682	.05244	.04061
3. Laguna	3.97633	699,736	175,973	4,064,605	490,689	.5954	.1064	.10420	.07779
4. Batangas	2.61009	926,308	316,581	4,990,913	807,270	.7311	.1750	.14315	.13164
5. Marinduque	1.50230	144,109	95,925	5,135,022	903,195	.7522	.1958	.34218	.17546
6. Quezon	.82235	932,402	1,194,615	6,117,424	2,097,810	.8961	.4549	.49241	.42952
7. Oriental Mindoro	.75231	328,364	436,472	6,445,788	2,534,282	.9442	.5495	.63922	.53043
8. Occidental Mindoro	.24495	144,032	587,985	6,589,820	3,122,267	.9653	.6770	.96530	.67700
9. Palawan	.15385	236,635	1,489,626	6,826,455	4,611,893	1.0000	1.0000		
						Cr = 0.68501 = 2.76732 — 2.08231			
VI. Bicol Region	1.68262	2,966,879	1,763,249						
1. Albay	2.64040	673,981	255,257	673,981	255,257	.2272	.1448	.06048	.05374
2. Sorsogon	1.99420	427,047	214,144	1,101,028	469,401	.3711	.2662	.20963	.18389
3. Camarines Sur	1.80077	948,436	526,682	2,049,464	996,083	.6908	.5649	.47299	.44017

Provinces By Region	Density Pop'n Hectare	C u m u l a t e d							
		Pop'n	Area	Pop'n	Area	P <sub>i</sub>	A <sub>i</sub>	P <sub>i</sub> A <sub>i+1</sub>	P <sub>i+1</sub> A <sub>i</sub>
4. Camarines Norte	1.24121	262,205	211,249	2,311,669	1,207,332	.7792	.6847	.71242	.64725
5. Masbate	1.21775	492,908	404,769	2,804,577	1,612,101	.9453	.9143	.94530	.91430
6. Catanduanes	1.07379	162,302	151,148	2,966,879	1,763,249	1.0000	1.0000		
						Cr = 0.16147 = 2.40032 — 2.23935			
VII. West Visayas	1.75420	3,785,403	2,157,904						
1. Iloilo	2.19380	1,167,973	532,397	1,167,973	532,397	.3094	.2467	.18997	.17459
2. Negros Occidental	1.89726	1,503,782	792,607	2,671,755	1,325,004	.7077	.6140	.52087	.49857
3. Capiz	1.49645	394,041	263,317	3,065,796	1,588,321	.8120	.7360	.66608	.64900
4. Aklan	1.44870	263,358	181,789	3,329,154	1,779,110	.8818	.8203	.77872	.75746
5. Romblon	1.23228	157,082	135,593	3,486,236	1,905,703	.9234	.8831	.92340	.88310
6. Antique	1.14659	289,172	252,201	3,775,408	2,157,904	1.0000	1.0000		
						Cr = 0.11622 = 3.07904 — 2.96272			
VIII. East Visayas	1.48303	5,395,731	3,638,311						
1. Cebu	3.17836	1,617,529	508,839	1,617,529	508,839	.2998	.1398	.09357	.07068
2. North Leyte	1.77182	1,110,626	626,826	2,728,155	1,135,665	.5056	.3121	.21503	.19731
3. Bohol	1.65959	683,297	411,726	3,411,452	1,547,391	.6322	.4253	.29903	.28869
4. Southern Leyte	1.44930	251,425	173,480	3,662,877	1,720,871	.6788	.4730	.42825	.38379
5. Negros Oriental	1.24481	715,240	574,577	4,378,117	2,295,448	.8114	.6309	.58989	.54750
6. North Samar	.87013	304,370	349,795	4,682,487	2,645,243	.8678	.7270	.76427	.69050
7. West Samar	.79098	442,244	559,103	5,124,731	3,204,346	.9498	.8807	.94980	.88070
8. East Samar	.62447	271,000	433,965	5,395,731	3,638,311	1.0000	1.0000		
						Cr = 0.28067 = 3.33984 — 3.05917			
IX. North Mindanao	.79593	4,947,067	6,215,402						
1. Sulu	1.58349	425,617	268,784	425,617	268,784	.0860	.0432	.01254	.01058
2. Davao del Sur	1.23149	785,398	637,762	1,211,015	906,546	.2448	.1458	.07266	.06616
3. Zamboanga del Sur	1.10245	1,034,018	937,920	2,245,033	1,844,466	.4538	.2968	.25390	.20283
4. North Cotabato	.69573	1,136,007	1,632,826	3,381,040	3,477,292	.6834	.5595	.45508	.42869
5. Zamboanga del Norte	.64879	409,379	661,810	3,790,919	4,139,102	.7662	.6659	.60231	.57294
6. South Cotabato	.62407	466,110	746,879	4,257,029	4,885,981	.8604	.7861	.78890	.74672
7. Davao del Norte	.54435	442,543	812,975	4,699,572	5,698,956	.9499	.9169	.94990	.91690
8. Davao Oriental	.48019	247,995	516,446	494,567	6,215,402	1.0000	1.0000		
						Cr = 0.19406 = 3.13529 — 2.94483			
X. South Mindanao	.75514	3,010,379	3,986,483						
1. Camiguin	2.34038	53,913	22,977	53,913	22,977	.0179	.0058	.00097	.00072
2. Misamis Occidental	1.64931	319,855	193,932	373,768	216,909	.1242	.0544	.01788	.01530
3. Misamis Oriental	1.32422	472,756	357,006	846,524	573,915	.2818	.1440	.06780	.06228
4. Lanao del Sur	1.17614	455,508	387,289	1,302,032	961,204	.4325	.2411	.13805	.13232
5. Lanao del Norte	1.12447	349,942	311,204	1,651,974	1,272,408	.5488	.3192	.21085	.20439
6. Agusan del Norte	1.07344	278,053	259,029	1,930,027	1,531,437	.6411	.3842	.29035	.27597
7. Surigao del Norte	.84785	232,228	273,902	2,162,255	1,805,339	.7183	.4529	.40728	.36422
8. Surigao del Sur	.56825	258,680	455,216	2,420,935	2,260,555	.8042	.5670	.62334	.53411
9. Rukidnon	.50008	414,762	829,378	2,835,697	3,089,933	.9420	.7751	.94200	.77510
10. Agusan del Sur	.19483	174,682	896,550	3,010,379	3,986,483	1.0000	1.0000		
						Cr = 0.33411 = 2.69852 — 2.36441			



TABLE III-A  
COMPUTATIONS OF MEASURES OF POPULATION  
CONCENTRATION (PHILIPPINES, 1960)

Provinces	Density Pop./Ha.	Area in Ha.	Population	Cumulated Area	Cumulated Population	Cumulated $A_i$	Cumulated $P_i$	$P_i A_{i+1}$	$P_{i+1} A_i$
1. Manila	297.443	3,828	1,138,611	3,828	1,138,611	.00013	.04200	.0003	.0000
2. Rizal	7.832	185,961	1,456,362	189,789	2,594,973	.00639	.09573	.0010	.0007
3. Cavite	2.937	128,755	378,138	318,544	2,973,111	.01073	.10968	.0020	.0014
4. Pampanga	2.831	218,068	617,259	536,612	3,590,370	.01808	.13245	.0032	.0027
5. Laguna	2.683	175,973	472,064	712,585	4,062,434	.02400	.14987	.0062	.0048
6. Cebu	2.619	508,839	1,332,847	1,221,424	5,395,281	.04114	.19904	.0103	.0092
7. Batangas	2.152	316,581	681,414	1,538,005	6,076,695	.05181	.22418	.0157	.0138
8. Pangasinan	2.094	536,818	1,124,144	2,074,823	7,200,839	.06989	.26565	.0209	.0200
9. Bulacan	2.080	267,203	555,819	2,342,026	7,756,658	.07389	.28615	.0250	.0241
10. Albay	2.017	255,257	514,980	2,597,283	8,271,638	.03749	.30515	.0282	.0276
11. La Union	1.965	149,309	293,330	2,746,592	8,564,968	.09252	.31597	.0349	.0325
12. Iloilo	1.815	532,397	966,266	3,278,989	9,531,234	.11045	.35162	.0482	.0443
13. Negros Occidental	1.694	792,607	1,342,504	4,071,596	10,873,738	.13715	.40114	.0579	.0568
14. Sorsogon	1.624	214,144	347,771	4,285,740	11,221,509	.14436	.41397	.0671	.0641
15. Camarines Sur	1.556	526,682	819,565	4,812,422	12,041,074	.16210	.44421	.0840	.0790
16. Leyte	1.466	800,306	1,172,972	5,612,728	13,214,046	.18906	.48748	.0989	.0963
17. Bohol	1.433	411,726	592,194	6,024,454	13,806,240	.20293	.50933	.1086	.1066
18. Tarlac	1.397	305,345	426,647	6,329,799	14,232,837	.21321	.52507	.1165	.1146
19. Ilocos Sur	1.311	257,958	338,058	6,587,757	14,570,945	.22190	.53754	.1228	.1213
20. Misamis Occidental	1.281	193,932	248,371	6,781,689	14,819,316	.22843	.54670	.1282	.1268
21. Aklan	1.244	181,789	226,232	6,963,478	15,045,548	.23456	.55505	.1352	.1330
22. Sulu	1.216	268,784	326,898	7,232,262	15,372,446	.24361	.56710	.1432	.1410
23. Capiz	1.197	263,317	315,079	7,495,579	15,637,525	.25248	.57873	.1478	.1472
24. Marinduque	1.195	95,925	114,586	7,591,504	15,802,111	.25571	.58296	.1594	.1548
25. Nueva Ecija	1.151	528,433	608,362	8,119,937	16,410,473	.27351	.60540	.1684	.1670
26. Bataan	1.058	137,296	145,323	8,257,533	16,555,796	.27815	.61076	.1817	.1760
27. Negros Oriental	1.040	574,577	597,761	8,831,810	17,153,557	.29749	.63281	.1915	.1900
28. Catanduanes	1.034	151,148	156,329	8,982,958	17,309,886	.30258	.63858	.2014	.1976
29. Misamis Oriental	1.023	379,983	388,615	9,362,941	17,698,501	.31538	.65292	.2142	.2104
30. Lanao del Sur	.977	378,327	387,289	9,741,268	18,085,790	.32812	.66720	.2220	.2205

Provinces	Density Pop./Ha.	Area in Ha.	Population	Cumulated Area	Cumulated Population	Cumulated $A_i$	Cumulated $P_i$	$P_i A_{i+1}$	$P_{i+1} A_i$
31. Romblon	.971	135,593	131,658	9,876,861	18,217,448	.33269	.67206	.2293	.2265
32. Antique	.945	252,202	238,405	10,129,062	18,455,853	.34119	.68085	.2371	.2347
33. Camarines Norte	.890	211,249	188,091	10,340,311	18,643,944	.34830	.68779	.2468	.2430
34. Lanao del Norte	.870	311,204	270,603	10,651,515	18,914,547	.35879	.69778	.2583	.2542
35. Ilocos Norte	.845	339,934	287,333	10,991,449	19,201,880	.37024	.70838	.2719	.2669
36. Masbate	.830	404,769	335,971	11,396,218	19,537,851	.38387	.72077	.2995	.2872
37. Zamboanga del Sur	.792	937,920	742,404	12,334,138	20,280,255	.41546	.74816	.3447	.3241
38. Samar	.646	1,342,863	867,994	13,677,001	21,148,249	.46070	.78018	.3692	.3631
39. Zambales	.574	371,440	213,442	14,048,441	21,361,691	.47321	.78805	.4046	.3843
40. Quezon	.547	1,194,615	653,426	15,243,056	22,015,117	.51345	.81216	.4289	.4213
41. Oriental Mindoro	.525	436,472	228,998	15,679,528	22,244,115	.52815	.82061	.4583	.4421
42. Cagayan	.495	900,267	445,289	16,579,795	22,689,404	.55847	.83703	.4880	.4749
43. Surigao	.494	729,118	359,997	17,308,913	23,049,401	.58303	.85032	.4964	.4960
44. Batanes	.492	20,928	10,307	17,329,841	23,059,708	.58374	.85070	.5529	.5158
45. Davao	.454	1,967,183	893,023	19,297,024	23,952,731	.65000	.88364	.6452	.5990
46. Cotabato	.432	2,379,705	1,029,119	21,676,729	24,981,850	.73016	.92161	.6935	.6805
47. Zamboanga del Norte	.425	661,810	281,429	22,338,539	25,263,279	.75245	.93199	.7348	.7135
48. Isabela	.415	1,066,456	442,062	23,404,995	25,705,341	.78837	.94830	.7601	.7516
49. Nueva Vizcaya	.354	390,389	138,090	23,795,384	25,843,431	.80152	.95339	.8101	.7770
50. Mt. Province	.304	1,431,813	435,839	25,227,197	26,279,270	.84975	.96947	.8368	.8274
51. Abra	.290	397,555	115,193	25,624,752	26,394,463	.86314	.97372	.8784	.8491
52. Agusan	.235	1,155,579	271,010	26,780,331	26,665,473	.90207	.98372	.9149	.8939
53. Bukidnon	.234	829,378	194,368	27,609,709	26,859,841	.93001	.99089	.9412	.9244
54. Occ. Mindoro	.143	587,985	84,316	28,197,694	26,944,157	.94981	.99400	.99400	.94981
55. Palawan	.109	1,489,626	162,669	29,687,320	27,106,826	1.00000	1.00000		
		29,687,320	27,106,826					16.0396	15.5844

$$\Sigma P_i A_{i+1} = 16.0396 - 15.5844$$

$$= .4552$$

TABLE III-B  
COMPUTATIONS OF MEASURES OF POPULATION  
CONCENTRATION (PHILIPPINES, 1970)

Provinces By Region	Density Pop./Ha.	Area in Ha.	Population	Cumulated Area	Cumulated Population	Cumulated $A_i$	Cumulated $P_i$	$P_i A_{i+1}$	$P_{i+1} A_i$
1. Manila	347.648	3,828	1,330,788	3,828	1,330,788	.0001	.0362	.0002	0
2. Rizal	15.297	185,961	2,844,689	189,789	4,175,477	.0060	.1135	.0015	.0008
3. Pampanga	4.161	218,063	907,275	407,857	5,082,752	.0129	.1381	.0028	.0020
4. Cavite	4.040	128,755	520,180	536,612	5,602,932	.0170	.1523	.0034	.0029
5. Laguna	3.976	175,973	699,736	712,585	6,302,668	.0225	.1713	.0066	.0048
6. Cebu	3.179	508,839	1,617,529	1,221,424	7,920,197	.0386	.2153	.0101	.0092
7. Bulacan	3.112	267,203	836,431	1,488,627	8,756,628	.0471	.2330	.0136	.0124
8. Batangas	2.926	316,581	926,303	1,805,208	9,682,936	.0571	.2632	.0172	.0161
9. Albay	2.640	255,257	673,981	2,060,465	10,356,917	.0652	.2815	.0231	.0208
10. Pangasinan	2.582	536,818	1,386,142	2,597,283	11,743,059	.0821	.3192	.0277	.0270
11. La Union	2.503	149,309	373,682	2,746,592	12,116,741	.0868	.3293	.0288	.0287
12. Camiguin	2.346	22,977	53,913	2,769,569	12,170,654	.0876	.3308	.0345	.0318
13. Iloilo	2.194	532,397	1,167,973	3,301,966	13,338,627	.1044	.3625	.0624	.0391
14. Sorsogon	1.994	2,141,144	427,047	5,443,110	13,765,674	.1721	.3741	.0738	.0714
15. Negros Occidental	1.897	792,607	1,503,782	6,235,717	15,269,456	.1972	.4150	.0858	.0848
16. Tarlac	1.833	305,345	559,708	6,541,062	15,829,164	.2068	.4302	.0961	.0943
17. Camarines Sur	1.801	526,682	948,436	7,067,744	16,777,600	.2235	.4560	.1109	.1087
18. North Leyte	1.772	626,826	1,110,626	7,694,570	17,888,226	.2433	.4862	.1246	.1228
19. Bohol	1.660	411,726	683,297	8,106,296	18,571,523	.2463	.5047	.1325	.1316
20. Misamis Occidental	1.649	193,932	319,855	8,300,228	18,891,378	.2625	.5134	.1433	.1409
21. Nueva Ecija	1.599	528,433	851,294	8,828,661	19,742,672	.2792	.5336	.1544	.1530
22. Sulu	1.583	268,784	425,617	9,097,445	20,168,289	.2877	.5481	.1600	.1594
23. Bataan	1.575	137,296	216,210	9,234,741	20,384,499	.2920	.5540	.1634	.1629
24. Marinduque	1.502	95,925	144,109	9,330,666	20,528,603	.2950	.5579	.1693	.1677
25. Capiz	1.496	263,317	394,041	9,593,983	20,922,649	.3034	.5686	.1771	.1757
26. Ilocos Sur	1.493	257,958	385,139	9,851,941	21,307,788	.3115	.5791	.1836	.1825
27. So-Leyte	1.4493	173,480	251,425	10,025,421	21,559,213	.3170	.5859	.1891	.1880
28. Aklan	1.4487	181,789	263,358	10,207,210	21,822,571	.3228	.5921	.1981	.1956
29. Misamis Oriental	1.324	357,006	472,756	10,564,216	22,295,327	.3340	.6059	.2134	.2089
30. Negros Oriental	1.245	574,577	715,240	11,138,793	23,010,567	.3522	.6254	.2245	.2228
31. Camarines Norte	1.241	211,249	262,205	11,350,042	23,272,772	.3589	.6325	.2297	.2286
32. Romblon	1.232	135,593	167,082	11,485,635	23,439,854	.3632	.6370	.2442	.2391
33. Davao del Sur	1.231	637,762	785,398	12,123,397	24,225,252	.3833	.6584	.2608	.2575
34. Masbate	1.218	404,769	492,908	12,528,166	24,718,160	.3961	.6718	.2744	.2710

Provinces	Density Pop./Ha.	Area in Ha.	Population	Cumulated Cumulated	Area Cumulated	Population $A_i$	Cumulated $P_i$	$P_i A_{i+1}$	$P_{i+1} A_i$
35. Lanao del Sur	1.176	387,289	455,508	12,915,455	25,173,668	.4084	.6842	.2849	.2826
36. Antique	1.147	252,201	289,172	13,167,656	25,462,840	.4164	.6920	.2949	.2921
37. Lanao del Norte	1.124	311,204	349,942	13,478,860	25,812,782	.4262	.7015	.3198	.3110
38. Zamboanga del Sur	1.102	937,920	1,034,018	14,416,730	26,846,800	.4559	.7296	.3385	.3361
39. Agusan del Norte	1.073	259,029	278,053	14,675,809	27,124,853	.4640	.7372	.3456	.3441
40. Catanduanes	1.074	151,148	162,302	14,826,957	27,287,155	.4688	.7416	.3557	.3520
41. Ilocos Norte	1.010	339,934	343,427	15,166,891	27,630,582	.4796	.7509	.3664	.3636
42. Benguet	.993	265,538	263,550	15,432,429	27,894,132	.4880	.7581	.3788	.3745
43. Zambales	.924	371,440	343,038	15,803,869	28,237,170	.4997	.7674	.3920	.3876
44. North Samar	.870	349,795	304,370	16,153,664	28,541,540	.5108	.7757	.4029	.3994
45. Surigao Norte	.848	273,902	232,228	16,427,566	28,773,768	.5194	.7820	.4357	.4200
46. Quezon	.822	1,194,615	982,402	17,622,181	29,756,170	.5572	.8087	.4649	.4573
47. West Samar	.791	559,103	442,244	18,181,284	30,198,414	.5749	.8207	.4831	.4770
48. Oriental Mindoro	.752	436,472	328,364	18,617,756	30,526,778	.5887	.8297	.4989	.4929
49. Abra	.706	397,555	280,768	19,015,311	30,807,546	.6013	.8373	.5467	.5220
50. North Cotabato	.696	1,632,826	1,136,007	20,648,137	31,943,553	.6529	.8682	.5916	.5772
51. Cagayan	.646	900,267	581,237	21,548,404	32,524,790	.6814	.8840	.6145	.6073
52. East Samar	.6245	433,965	271,000	21,982,369	32,795,790	.6951	.8913	.6406	.6284
53. South Cotabato	.624	746,879	466,110	22,729,248	33,261,900	.7187	.9040	.6686	.6577
54. Zamboanga del Norte	.619	661,810	409,379	23,391,058	33,671,279	.7396	.9151	.7076	.6898
55. Isabela	.608	1,066,456	648,123	24,457,514	34,319,402	.7733	.9327	.7328	.7260
56. Nueva Vizcaya	.569	390,389	221,965	24,847,903	34,541,367	.7857	.9388	.7511	.7431
57. Surigao del Sur	.568	455,216	258,680	25,303,119	34,800,047	.8001	.9458	.7573	.7569
58. Batanes	.545	20,928	11,398	25,324,047	34,811,445	.8007	.9461	.7820	.7672
59. Davao del Norte	.544	812,975	442,543	26,137,022	35,253,988	.8265	.9581	.8170	.8012
60. Bukidnon	.500	829,378	414,762	26,966,400	35,668,750	.8527	.9694	.8424	.8323
61. Davao Oriental	.480	516,446	247,995	27,482,846	35,916,745	.8690	.9761	.8547	.8505
62. Mt. Province	.444	209,733	93,112	27,692,579	36,009,857	.8756	.9787	.8648	.8591
62. Ifugao	.367	251,778	92,487	27,944,357	36,102,396	.8836	.9812	.8852	.8704
64. Occ. Mindoro	.245	587,985	144,032	28,532,342	36,246,396	.9022	.9851	.9166	.8931
65. Agusan del Sur	.195	896,550	174,682	29,428,892	36,421,058	.9305	.9899	.9432	.9245
66. Kalinga-Apayao	.193	704,764	136,249	30,133,656	36,557,307	.9528	.9936	.9936	.9528
67. Palawan	.159	1,489,626	236,635	31,623,282	36,793,942	1.0000	1.0000		
								23.1128	22.7125

$$Cr = \sum P_i A_{i+1} = 23.1128 - 22.7125 = .4003$$