

Part II: The North Mindanao Region

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Much current planning and many hopes are currently based upon the development of Mindanao, which is thought of as the "Land of Promise" for the Philippines. Its relatively less densely populated farm areas as well as its forests and mineral deposits have made it attractive to settlers and businessmen so that its population has mushroomed through migration from more northerly islands. While accounting for 33.2 per cent of the land area of the Philippines, Mindanao (with small adjacent islands but without the Sulu Archipelago) was the home of but 12.5 per cent of the Filipino people in 1939. But by 1960, migration had swelled this total to 5.1 million people, or 18.7 per cent of the national population. Meanwhile, Luzon, the largest and most populated island, which without Mindoro and Palawan (but with small, adjacent islands) included 38.2 per cent of the Philippine land area, contained 49.7 per cent of the population in 1960, an increase of but 0.7 per cent from its 1939 standing of 49.0 per cent. It should be noted that in 1960, Mindanao was approaching Luzon's 1939 population and density.¹

¹ The land area of the entire Philippines is given in the 1939 Census (II, *Summary of Population*: p.43) as 29,740,970 hectares, which checks with the figure in Funk and Wagnall's *Student Standard Dictionary* (p. 852) of 29,409.7 square kilometers. The figure given by the Department of Agriculture in their *Philippine Agricultural Statistics* (II, 1956: pp. 3-4, Ta. 1) is slightly different: 29,741,290 hectares.

Luzon without Palawan and Mindoro but with other small adjacent islands (including the Batanes, the Catanduanes, Marinduque, and Masbate) had an area, according to the *Philippine Agricultural Statistics* (II: pp. 3-4) of 11,361,750 hectares, while Mindanao without Sulu but with

In view of Mindanao's growth and less densely populated lands, the contribution of its birth and mortality rates to the national population growth assumes special importance. The preceding paper considered estimates of such rates for the Philippines in general. This paper will evaluate estimates of the north Mindanao area in particular, as a contribution towards better knowledge of Mindanao population characteristics.

The North Mindanao Region. By this term, the present writer means the area and population of seven provinces: Agusan, Bukidnon, Lanao del Norte, Misamis Occidental, Misamis Oriental, and the two Surigao provinces. The reasons for grouping these provinces are not merely geo-

other small adjacent islands was 9,869,260 hectares in area.

Luzon's 1939 population (also less Palawan and Mindoro but with the same adjacent islands) was 7,841,169, which was 49.006 per cent of the Philippine population of 16,000,303 (*Summary of Population*: p. 45, ta. 2, and p. 42, ta. 1), while Mindanao's population (with the same adjacent islands but without Sulu) was 1,997,304 persons. This was 12.482 per cent of the total population.

Luzon's population in 1960 (for the same area as 1939) was 13,453,807 persons out of a total Philippine population of 27,087,685, a growth of 71.6 per cent in 21 and 1/8th years, while Mindanao's population was now (for the same area) 5,057,266 persons, an increase of 153.2 per cent, more than double the percentage increase of Luzon. It now contained 18.67 per cent of the national population, while Luzon contained 49.67 per cent (Census, 1960, II, *Summary of Population and Housing*, 1963: pp. 3-7, ta. 4.).

The Philippine density was 53.8 persons per square kilometer in 1939, and 91.1 in 1960. Luzon for the same two years was 69.0 and 118.4, while Mindanao was 20.2 and 51.2 respectively. Note that Mindanao is approaching the 1939 Luzon density and population.

graphical but cultural. The Christian peoples of these provinces are very much alike in factors which are commonly thought to affect fertility: rural residence, profession of the Catholic religion, low levels of education, and the farming occupation. The chief crops produced are rice, corn, and coconuts, while most of the population has migrated (personally or through ancestors) from Bohol and Cebu, both of which speak the Cebuano Visayan dialect and have many cultural practises in common.

Bukidnon and Lanao del Norte are to some degree exceptions to this rule of similarity because the populations of both contain much larger proportions of non-Christian peoples (Muslims and the so-called "indigenous," or tribal peoples), are more limited in educational attainments, and are less developed in terms of roads and medical facilities. An examination of Table 1 will reveal, however, that even these two provinces have much in common with the other five.

General Principles Regarding North Mindanao Fertility and Mortality. Unless general principles which relate to the north Mindanao area are kept in mind, one may arrive at highly misleading estimates of birth or death rates. The first of these is that in provinces where levels of education are low, where the main occupation is agricultural, where the kinship system is strong, where the mores approve of the large family, where the Catholic religion is predominant, and where the great majority of the people reside in rural areas, one must not expect to find lower birth rates than in provinces where higher levels of education, city residence, and factory, business, or other indoor occupations are much more common, or where sizable segments of the population profess religions which favor family limitation by contraceptive methods for economic or other social rea-

sons. Secondly, in provinces where roads are very poor and few (linking only the main population centers) while trails from other towns and villages to such roads are often quite arduous, where doctors in vast rural areas are but a handful while the practise of folk-medicine (through *sirujanos* and others) flourishes, and where the one or two existing hospitals are very far distant from each other and doctors' fees and medical prescriptions are financially difficult for the common man — and in some cases beyond his ability to pay, — in such cases one cannot expect the death rates to be less than those of provinces and cities with better facilities, more abundant medical personnel, and better education. Accordingly, common sense postulates for the north Mindanao region birth and death rates not significantly less than average national rates. Thus one immediately suspects registration data or even Census data which would tend to show that such less developed provinces have lower birth rates or more favorable death rates than provinces and cities with more advanced economies. The first of these two companion papers presented today concluded to a national birth rate of approximately 50 births per 1,000 persons of the general population and national death rates of 21.6 and 18.5 deaths per 1,000 for the periods 1948-1954, and 1954-1960, respectively. These then would seem to be the minimum estimates to be arrived at with regard to the north Mindanao area.

Vital Studies Upon North Mindanao Fertility. Not as many estimates are available for the north Mindanao region as were available for the Philippines as a whole.

Dr. Taeuber analyzed provincial data for north Mindanao provinces as well as other provinces in her study of the 1939 Census. Only one Lanao province existed at that time and relatively fewer Christians resided in the entire province. In

TABLE 1.
PER CENT OF SPECIFIED PROVINCIAL POPULATIONS BY CATEGORIES
OF EDUCATIONAL ATTAINMENT, RELIGIOUS AFFILIATION, AND
MOTHER TONGUE.

| Province | Highest Grade Completed | | Religious Affiliation | | Mother Tongue ^a | |
|--------------------------|-------------------------|----------|-----------------------------|----------|--------------------------------|----------|
| | Grade | Per Cent | Religion | Per Cent | Tongue | Per Cent |
| Agusan Province | 0 — | 41.7 | Catholic | 89.9 | Cebuano | 80.7 |
| | 1-5 — | 34.9 | Protestant | 3.0 | Manobo | 4.8 |
| | 6-9 — | 17.9 | Aglipayan | 4.5 | Hiligaynon | 3.5 |
| | 10 + — | 5.4 | Muslim | 0.1 | Samar | 2.6 |
| Misamis Occ. Prov. | 0 — | 39.2 | Catholic | 67.7 | Cebuano | 97.7 |
| | 1-5 — | 37.2 | Protestant | 4.7 | Subanon | 0.8 |
| | 6-9 — | 17.7 | Aglipayan | 24.6 | Hiligaynon | 0.4 |
| | 10 + — | 5.9 | Muslim | 0.1 | Chinese | 0.3 |
| Misamis Or. Prov. | 0 — | 39.2 | Catholic | 87.1 | Cebuano | 95.6 |
| | 1-5 — | 36.5 | Protestant | 1.5 | Binukid | 1.4 |
| | 6-9 — | 18.6 | Aglipayan | 9.6 | Tagalog | 1.3 |
| | 10 + — | 5.6 | Muslim | 0.2 | Chinese | 0.4 |
| Surigao Province | 0 — | 39.7 | Catholic | 84.4 | Cebuano | 97.1 |
| | 1-5 — | 40.1 | Protestant | 0.5 | Samar-Ley | 1.4 |
| | 6-9 — | 16.4 | Aglipayan | 11.8 | Hiligaynon | 0.5 |
| | 10 + — | 3.8 | Muslim | 0.05 | Tagalog | 0.3 |
| Bukidnon Province | 0 — | 49.2 | Catholic | 82.3 | Cebuano | 52.5 |
| | 1-5 — | 33.7 | Protestant | 6.6 | Binukid | 32.8 |
| | 6-9 — | 13.3 | Aglipayan & Muslim | 4.1 | Hiligaynon | 5.1 |
| | 10 + — | 4.1 | Other (Animism) .. | 6.7 | Manobo | 2.6 |
| Lanao del Norte Prov. | 0 — | 54.5 | Catholic | 73.2 | Cebuano | 80.5 |
| | 1-5 — | 29.6 | Protestant | 2.0 | Maranao ^b | 12.3 |
| | 6-9 — | 11.7 | Aglipayan | 2.1 | Maguindanao ^d | 2.0 |
| | 10 + — | 4.1 | Muslim | 20.9 | Ilanum ^b | 1.9 |

^a Mother Tongues are rank ordered according to the percentages of population with such mother tongues.

^b Maranao and Ilánum (Iranon) are essentially the same language.

^c Maguindanao, Maranao and Ilánum are dialects of the Muslim Filipinos.

Source: *Census of the Philippines: 1960*, Vol. I. *Reports by Provinces*.

addition, relatively fewer Christians then resided in Bukidnon than at present. Nevertheless, keeping these qualifications in mind, her data are relevant.

She found indications (1960: pp. 106-07) of relatively high fertility for the two Misamis provinces, for Surigao (one province through the 1960 Census), and for Agusan, but of lower fertility for Bukidnon and Lanao del Norte. This indication of lower fertility possibly was

entirely due to relatively greater infant and child mortality among Muslim and native peoples in comparison with Christians of the neighboring provinces, coupled with a forgetfulness of these deceased children at the time of the 1939 census enumeration. For most of the Muslim and "indigenous" women were illiterate at that time. In terms of children ever born per 1,000 ever-married women of ages 45-54, her findings are as follows in rank order of fertility:

| | Misamis Occid. | Misamis Orient. | Surigao Prov. | Agusan Prov. | Lanao Prov. | Bukidnon Prov. | Philippine Average |
|---------------------------------|-------------------|--------------------|------------------|-----------------|----------------|-------------------|-----------------------|
| Children Ever Born | 7,279 | 6,984 | 6,940 | 6,646 | 5,933 | 5,755 | 6,576 |
| Per Cent of National Average | 110.7 | 106.2 | 105.5 | 101.1 | 90.2 | 87.5 | 100.0 |

Averaging these rates per 1,000 married women, even without weighting, one computes an average fertility exceeding the national mean, namely, 6,590. This may in fact indicate fertility exceeding the national average up to 1939 but the nature of the Census data makes caution necessary.

Mendoza-Pascual (1962: pp. 176-77, 180) computed replacement ratios (chil-

dren 5-9 years of age per 1,000 women of ages 15-44) for the north Mindanao provinces except Lanao, in her study of provincial vital rates based on the 1960 Census. She also computed replacement ratios for the same provinces from the 1948 Census. Her data also seem to indicate above-average fertility for the north Mindanao region, both for 1948 and 1960.

| | Misamis Occid. | Misamis Orient. | Surigao Prov. | Agusan Prov. | Bukidnon Prov. | Philippine Average |
|-----------------------------|-------------------|--------------------|------------------|-----------------|-------------------|-----------------------|
| Children 5-9, 1948 | 793 | 748 | 784 | 757 | 726 | 689 |
| Per Cent of Nat. Average | 115.1 | 108.6 | 113.8 | 109.9 | 105.4 | 100.0 |
| Children 5-9 1960 | 758 | 833 | 730 | 806 | 865 | 758 |
| Per Cent of Nat. Average | 100.0 | 109.9 | 96.3 | 106.3 | 114.1 | 100.0 |

The average unweighted replacement ratios for the north Mindanao provinces computed by the present writer from Mendoza-Pascual's data are 762 for 1948 and 798 for 1960, which would exceed the national averages for these years respectively by 10.6 per cent and 5.3 per

cent. For comparison, the present writer computed from the 1960 Census data (I, Tables 4 & 5; II, Tables 6 & 8) the children under five years per 1,000 women 15-44 years of age, and per 1,000 *ever-married* women of the same ages. These averages are:

| | Misamis Occid. | Misamis Orient. | Surigao Prov. | Agusan Prov. | Lanao del Nor. | Bukidnon Prov. | Philippine Averages |
|---|-------------------|--------------------|------------------|-----------------|-------------------|-------------------|------------------------|
| Children 0-4, per 1,000 women | 783.9 | 895.2 | 775.5 | 929.5 | 847.5 | 992.0 | 793.1 |
| Per Cent of Nat. Aver. | 98.8 | 112.9 | 97.8 | 117.2 | 106.9 | 125.1 | 100.0 |
| Children 0-4, per 1,000 marr. women | 1,321.8 | 1,416.5 | 1,203.9 | 1,332.4 | 1,194.6 | 1,327.1 | 1,281.5 |
| Per Cent of Nat. Aver | 103.1 | 110.5 | 93.9 | 104.0 | 93.2 | 103.6 | 100.0 |

These measures of north Mindanao fertility are also above average, since they are respectively 109.8 and 101.4 per cent of the national mean. Does this combined evidence show that the fertility of north Mindanao married women is higher than the national average? Perhaps, but before such a conclusion is reached, alternative hypotheses should first be examined more searchingly than the data now available permit. Some of these alternatives would be: errors in the census data caused by underenumeration and overenumeration, misstatement of age, varying proportions of women married and single, and the swell-

ing or deflation of certain groups in the age pyramid through net in-migration. A crude birth rate of 54.9 (which would be 109.8 per cent of 50 births per 1,000) is one requiring rather conclusive proof.

Mendoza-Pascual not only compared provincial fertility by the method just described but also estimated crude birth rates for each province for the 1950-1955 period, using the reverse survival technique. Drawing ratios from the United Nations' model life table with expectation of life at birth of 47.5 years, she arrived at the following north Mindanao provincial rates:

| | Misamis Occid. | Misamis Orient. | Surigao Prov. | Agusan Prov. | Bukidnon Prov. | Philippine Average |
|--|-------------------|--------------------|------------------|-----------------|-------------------|-----------------------|
| Crude Birth Rates Per 1,000 Per Cent | 46 | 46 | 48 | 68 | 76 | 50 |
| Nat. Mean | 92.0 | 92.0 | 96.0 | 136.0 | 152.0 | 100.0 |

The present writer believes that failure to take internal migration into consideration has vitiated the validity of these rates. Apparently, Mendoza-Pascual's population bases depend at least partly on arithmetic progression from the 1948 Census (1962; p. 174) and these do not, it would seem, square well with the number of births computed by the reverse survival methodology from the 1960 Census. No particular reason is apparent why Agusan Province should differ so very radically in fertility from the two Misamis and Surigao provinces, since all of them are culturally much alike.

Can one nevertheless conclude to provincial fertility differentials because of the evidence presented? In considering the possibility, one would do better to restrict one's self to marital fertility in order to avoid pitfalls caused by unusual or differing marital-status differences which might result from migration.

Percentages indicating relative marital fertility, based upon national averages, suggest the possibility of a differential in fertility between Lanao del Norte and the five provinces which are almost entirely Christian: Agusan, the two Misamis, and the two Surigaos. Based upon Taeuber's and Madigan's data given above, these percentages are:

Lanao (both provinces), 1939
90.2

Lanao del Norte, 1960
93.2

Christian Provinces, 1939
105.9

Christian Provinces, 1960
102.9

Beyond this possible differential, the limited data at hand provide little indication of further fertility differences.

The Bukidnon data for both 1939 and 1960 are suspect because of the difficulties of census enumeration in this pro-

vince, and for 1960 in particular because of the comparatively huge in-migrations since 1948. The relative fertility data for the other provinces fluctuate from one census date to the other, a fact which possibly reflects errors of enume-

ration, differing age structures due to net in-migration, and to some extent sampling variation. Expressed in terms of percentages of national means, the relative fertility, based on these data of Taeuber and of Madigan are:

| | Misamis Occid. | Misamis Orient. | Surigao Prov. | Agusan Prov. | Bukidnon Prov. | Philippine Averages |
|------|-------------------|--------------------|------------------|-----------------|-------------------|------------------------|
| 1939 | 110.7 | 106.2 | 105.5 | 101.1 | 87.5 | 100.0 |
| 1960 | 103.1 | 110.5 | 93.9 | 104.0 | 103.6 | 100.0 |

By reverse survival methods, taking account of an estimated 7.6 per cent net in-migration between 1939-1960, the present writer computed death rates for the periods from 1939 to 1960 for Misamis Oriental Province. These will be discussed shortly. However, by estimating the range of natural increase, which

should not be far from the national intercensal growth (because important national net immigration has not occurred), estimates of the birth rates of Misamis Oriental Province were derived from the death rates.² These birth estimates are as follows:

| | 1939-1948 | 1948-1954 | 1954-1960 |
|--|-------------|-------------|-------------|
| Estimated range of natural increase per 1,000 | 18.1 — 19.1 | 26.0 — 27.0 | 29.0 — 31.0 |
| Estimated birth rate Misamis Or. | 49.2 — 50.2 | 49.3 — 50.3 | 50.3 — 52.3 |

These estimates generally agree with expectations based on general principles for Misamis Oriental Province, namely, a birth rate of not less than 50 births per 1,000.

If, as the present writer believes, data for Misamis Oriental can be considered representative for the other predominantly Christian provinces of north Mindanao, then data from two sample studies carried out by the Research Institute for Mindanao Culture in 1958 and 1959 in urban and rural Cagayan de Oro can be used as checks upon the results from these statistical derivations from the censuses. The urban study of 103 households by Antonio J. A. Pido (1961:

p. 39) and the rural study of 398 households by Madigan (1962a: 71-2; 1962b: 173-74), both based upon probability sampling,³ gave the following results in terms of births per 1,000 currently married women:

²The net immigration into the Philippines has been negligible since 1939. The two average national intercensal rates of increase per year have been 1.91 per cent for the 1939-1948 period, and 3.06 per cent for the 1948-1960 period. (Census, 1960: p. 2).

³The rural barrios themselves were chosen purposively, not by probability sampling, but the households interviewed within the barrios were chosen by probability sampling in two of the three barrios. The third barrio was completely enumerated. The barrio crude birth rates differed among themselves as follows:

| | |
|-----------------------|-------------------------------|
| Mountain Barrio . . . | 47.9 births per 1,000 persons |
| Inland Barrio . . . | 47.1 births per 1,000 persons |
| Coastal Barrio . . . | 52.1 births per 1,000 persons |
| Combined Rate . . . | 47.7 births per 1,000 persons |

| | Ages of Mothers | | | | | | |
|---------------|-----------------|-------|-------|-------|-------|-------|-------|
| | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |
| Rural Cagayan | 387.7 | 458.9 | 447.9 | 403.0 | 289.7 | 141.2 | 36.8 |
| Urban Cagayan | 318.1 | 453.2 | 403.5 | 335.3 | 287.5 | 177.9 | 79.8 |

If these rates are standardized upon the age distribution of the 1948 Misamis Oriental Province population as enumerated in the census, the following standardized birth rates result:

| | Births per 1,000 persons of general population |
|---------------|--|
| Urban Cagayan | 43.7 |
| Rural Cagayan | 47.7 |
| City Rate | 46.2 |

These rates refer to no particular calendar year but to the whole fertile life of the women of the samples. However they manifest no fertility decline over time, when analyzed by birth cohorts of married women of ages 15-29, the most fertile years of life. The following rates per 1,000 were found:

| Marital Birth Rate, 15-29 | Birth Cohorts of Mothers | | | | | |
|---------------------------|--------------------------|-----------|-----------|-----------|-----------|-----------|
| | 1880-1889 | 1890-1899 | 1900-1909 | 1910-1919 | 1920-1929 | 1930-1939 |
| | 400.0 | 398.0 | 448.4 | 414.0 | 452.3 | 471.9 |

Using a life table with expectation of 43.6 years of life at birth, the present writer estimated the net reproduction rate of rural Cagayan at 2.20 and of urban Cagayan at 2.04. This means, in both cases, that the population would more than double in one generation.

Since undoubtedly some underenumeration of children ever born was present in the sample data, the results check reasonably well with an estimated Misamis Oriental birth rate of approximately 50 per 1,000. Sampling variation may also explain why the standardized rural rate is not somewhat higher than 47.7. A much larger urban Cagayan sample study now being carried out by the Research Institute for Mindanao Culture (married respondents in 2,074 households were interviewed) should shortly furnish a clearer picture of fertility in the Cagayan poblacion.

Before turning to a consideration of death rates, a question may be raised about the rural-urban differentials which the sample study suggests. Dr. Mercedes B. Concepcion in her study of 1948 census and later PSSH data, found differences between the fertility of women

45 to 64 years of age who lived in cities and provincial capitals of the Philippines and rural women of the same ages, even though she had controlled the data for education (1963: pp. 62-76, 111-112). Lower fertility was especially observed in Manila. Dr. Concepcion on the basis of her data concluded: "This leads one to suspect that urban-rural fertility differences are of relatively long standing, probably pre-existing recent industrialization" (1963: p. 76). K. M. Jupp (1960) also found evidence of rural-urban fertility differences in an analysis of the 1956 PSSH data, particularly for Manila. The present writer believes that it would be strange not to find some such differentials, simply because of the contrasting nature of urban and rural life, especially when the differing implications of space, occupation, and recreation in urban and rural environments are taken into account. Such differentials are probably nothing new, and by themselves alone should not be taken as signs of an incipient decline in national fertility, with the possible exception of the Manila population, in which the degree of lower fertility is more pronounced.

Mortality in North Mindanao. Mendoza-Pascual (1962: pp. 178-189) has estimated crude death rates for provinces of the Philippines, including the north

| | Agusan Prov. | Bukidnon Prov. |
|------------------------|-----------------|-------------------|
| Death Rate | 18 | 14 |
| Per cent National Mean | 112.5 | 87.5 |

The present writer feels that the differentials between provinces like Bukidnon and Surigao shown by these rates do not square with reality. The rates were computed by correcting five year moving averages of registered provincial death rates by a completeness-of-registration factor. This factor was obtained by dividing the five year moving average of the registered provincial *birth* rate by Mendoza-Pascual's estimate of the provincial *birth* rate, multiplying by 100, and adding 5 per cent to the resulting percentage. The basis for the last procedure was the assumption that *for every province* in the Philippines, registration of deaths is always 5 per cent more complete than registration of births, a rather dubious presumption, it would seem.

To conclude that Bukidnon's death rate is less than the national average by 12.5 per cent, and only 70 per cent as large as the Surigao death rate (14/20) seems highly questionable in view of Bukidnon's relative lack of doctors, medical facilities, and hospitals, and in view of the absence of the most elementary medical knowledge on the part of great numbers of her people. No reasonable grounds are evident, too, for such differences as the table exhibits between the death rates of Agusan and Misamis Oriental Provinces on the one hand and Misamis Occidental Province on the other. Further, the general level of mortality for the region, 17.0 deaths per 1,000 (a weighted average computed from the table and the census data by the

Mindanao region (but without Lanao del Norte). Per 1,000 persons these rates for the period 1950-55 (or for the year 1953) are as follows:

| Misamis Occid. | Misamis Orient. | Surigao Prov. | Philippine Average |
|-------------------|--------------------|------------------|-----------------------|
| 14 | 17 | 20 | 16 |
| 87.5 | 106.2 | 125.0 | 100.0 |

present writer), seems too low for the 1950-55 period.

The present writer believes that realistic estimates of north Mindanao death rates cannot be calculated without taking account of net provincial in-migration in statistical derivations ultimately based on census or PSSH distributions, or without conducting sample surveys. The Research Institute for Mindanao Culture's 2,074 interview sample survey is also gathering mortality data for Cagayan de Oro but these are at this time not available. However the present writer, feeling that Misamis Oriental's death rates would be typical of Agusan, Misamis Occidental, and the two Surigao provinces, and somewhat more favorable than the death rates of Lanao and Bukidnon, computed death rates for Misamis Oriental by applying survival ratios to the 1939 Census and aging it through to the 1960 Census.⁴

On the basis of in-migration found in the 1959 rural study of the Research Institute, and comparison of the provincial and national geometric rates of increase, 1939-1960 (2.9 and 2.5 per cent per year, respectively), the writer estimated the net in-migration to Misamis Oriental, 1939-1960, to be approximately 7.6 per cent of the 1960 population total.

⁴ Five-year survival ratios were applied to the smoothed 1939 age-sex distribution of the population and thus it was aged to January 1, 1949, and then projected backwards to October 1, 1948, at the same geometric rate as evidenced between 1939 and 1949. The same procedure was used for the period January 1, 1949 — January 1, 1959 except that the population computed for January 1, 1959, was projected forwards to February 15, 1960.

Using the United Nations' life tables, and assuming a constant age-standardized birth rate of 53 births per 1,000, he computed rates for the periods 1939-1948, 1948-1954, and 1954-1960. The expectations of life at birth of these life tables (when values for both sex tables are averaged) were 27.5 years (for men of military ages) and 32.5 years (for the others) for the period 1939-1948; 40.0

years for 1948 to 1954; and 42.5 years for the 1954-1960 period. The 1960 population thus computed was 7.55 per cent less than the enumerated population of the 1960 Census (359,270 as opposed to 388,615 persons). This was the amount by assumption to be attributed to net in-migration. The death rates and expectations of life which resulted from these computations follow:

| Period | Crude Death Rate | Life Table Death Rate | Expectation of Life at Birth |
|-----------|------------------|--------------------------|------------------------------|
| 1939-1948 | 31.1 | 30.8 — 40.0 ^a | 27.5 ^a — 32.5 |
| 1948-1954 | 23.3 | 25.0 | 40.0 |
| 1954-1960 | 21.3 | 23.5 | 42.5 |

^a The higher death rate and the lower expectation of life are for men of the military ages (those who were 15-34 in 1939).

The death rates of this table for 1948-1960 would be 7.9 per cent (23.3/21.6) and 15.1 per cent (21.3/18.5) higher than the average national rate as computed by Madigan-Avanceña in the first of these two companion papers. These higher percentages do not seem excessive in view of the limited medical facilities and personnel of Misamis Oriental rural areas. The same death rates are probably applicable to the other predominantly Christian provinces of North Mindanao, too, allowing something for slightly differing circumstances and for chance variations. One would expect the crude rates for Bukidnon and Lanao del Norte to be somewhat higher, perhaps as high as 23 deaths per 1,000. For the region as a whole, the current death rates (June, 1964) may be as low as 20 per 1,000.

Summary and Evaluation. The fertility of the north Mindanao region seems rather clearly, on the basis of several different types of evidence, to be at least as high as the national level of approximately 50 births per 1,000, and

possibly slightly higher. Rural-urban fertility differentials probably exist, and possibly differences exist too between Muslim-Christian fertility.

On the other hand, the death rates of the region seem less favorable than national averages. Improvements in medical facilities and greater availability of medical personnel could change this picture, but such changes cannot realistically be expected to materialize in large degree in the near future. Thus it would seem that natural increase in the north Mindanao area must continue to be supported by in-migration if population growth in the area is to keep abreast of or to surpass national increases in population. Nevertheless, considered absolutely, the growth of population from the surplus of births over deaths is very large and north Mindanao, despite its many sparsely settled interior valleys and plateaus, will find it difficult to raise the living levels of its rural masses in the face of such population increases.

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Basic Relations in Theoretical Models: A Socio-Economic Approach

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Introduction

The relation between theory and practice has always been difficult to define. Sometimes, the theory is so abstract that it has no practical application, or it is so concrete that it may provide little or no insight into specific relations. Sciences dealing with development, in particular, feel the defects in the theory-practice relationship and are constantly hindered and frustrated by these defects.

Nowadays, sociology and economics are the sciences which focus their attention on development problems, probably with more *volens* than *volens*, but nevertheless compelled by the needs of today's world. These needs do not merely ask for understanding; they demand direct remedies. Both of the above

sciences attempt an answer—each bringing forward a plan, a model or structure of change—but both are aware that their proposals are not yet ready for consumption. Yet, neither can be blamed for neither has had time to study the whole field covered by its model. It can even be said that sociology and economics are so young that they are still trying to determine which factors merit their attention. They are still busy bridging gaps between these factors so that some sort of cause-and-effect relationships can be established. How then can one expect sociologists and economists to give solutions to complexities which, in the first place, are not yet understandable in either the sociological or economic sense?

Related to the above problem is the emphasis on specialization felt in all