# INFLUENCE OF DEVELOPMENTAL INFRASTRUCTURE UPON POPULATION AND HOUSEHOLD CHARACTERISTICS: THE CASE OF TWO SEGMENTS OF MISAMIS ORIENTAL PROVINCE*

*by*

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## Introduction

In a companion piece to the present paper delivered at the 1980 Sociological Convention at Diliman, the writer has reported upon income and employment aspects associated with the MORESCO I rural electric service cooperative located in the ten western municipalities of Misamis Oriental Province. The present paper examines certain population and household differences between two areas of this Province (to be explained in succeeding Sections) and attempts to associates these with the electrification project. Map I shows the location of Misamis Oriental Province in Northern Mindanao.

## Research Design

### *Quasi-Before and Quasi-After Design*

No benchmark data were available for the study of the MORESCO I cooperative. The present duty was commissioned in 1977, and fielded only in 1978. The electric service cooperative however had been funded by the NEA and the AID in 1969, and had begun supplying electricity in 1971. Although the Research Institute

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had carried out previous studies on the MORESCO I Cooperative, the first of these began in late 1975.

On the other hand, analysis of 1960 and 1970 Census data for Misamis Oriental Province, which includes many items broken down to the municipal level, showed great similarity between the electrified Provincial segment (the 10 municipalities of the Province westwards of Cagayan de Oro City, and the proposed MORESCO II segment, which includes Balingasag Municipality) and the ten other municipalities north and eastwards of Balingasag. This study also included in the northeastern segment the barrios, but not the Poblacion of Gingoog City (which was electrified independently of MORESCO II at the time). Map 2 presents an area map of the City of Cagayan de Oro (its official title) upon whose western border the MORESCO I segment begins.

The investigation of the Census data was of course limited to a comparison of the municipalities just alluded to, and their barrios. These were Alubijid, El Salvador, Gitagum, Initao, Laguindingan, Libertad, Lugait, Manticao, Naawan, and Opol on the west of Cagayan, and Balingasag, Balingoan, Binuangan, Claveria, Kinoguitan, Lagonglong, Magsaysay, Medina, Salay, Sugbungcogon, and Talisayan, together with the barrios of Gingoog City, all of which are in the northeastern segment of the Province. Neither Cagayan itself nor the Municipalities of Jasaan, Tagoloan, and Villanueva are included. All of these are provided with electricity by the commercial public utility, Cagayan Electric Power and Light Company (CEPALCO). Map 3 shows the location of all these areas.

Density of the western Provincial segment was 106.8 persons and that in the northeastern segment 78.1 persons per square kilometer. However, most of the relative sparseness of population of the northeast is due to the inclusion of Claveria Municipality, a very large area with a relatively small population for its size. If Claveria is removed, the density in the remaining northeastern segment is 123.3 persons per square kilometer. The population reported in the MORESCO I area in 1960 was 86,719 persons for 812.19 square kilometers, while that reported by the Population and Agricultural Censuses of 1960 for the northeastern, or MORESCO II area, was 165,628 persons for 2,121.94 square kilometers.

Fertility between the two segments in 1960 was judged fairly similar on the bases of the percentage of the population less than 15 years of age, which is a fairly good indicator of fertility level. The Misamis Oriental report gave the basic data from which the following two percentages of persons less than 15 years of age was computed:

| *Eastern Segment* | *Western Segment* |
|---|---|
| 50.3 | 48.8 |

Both percentages indicate high fertility, probably from 45 to 50 births annually per thousand persons of the general population.

Literacy and highest grade completed again showed considerable similarity. For persons 10 years or more in age the percentage of literates was 75.4 in the northeast and 68.3 in the west. Two measures show the similarity of the two segments in educational attainments. (These included the entire population, thus the high percentages of persons with no grade completed, e.g. infants, etc.)

| | *No Grades Completed* | *High School Completed* |
|---|---|---|
| Northeast | 40.5% | 4.0% |
| West | 44.1% | 3.0% |

Social status was measured by the percentage of *barong-barong* dwelling units as one indicator, and by the percentage classification of household dwelling units by building materials used. Results were (Part II, *Housing*, Tables 1 and 2):

*Proportion of the Population Experiencing Real Penury*

| | *Northeast* | *West* |
|---|---|---|
| Percentage of Barong-barongs among all dwelling units | 12.5 | 9.6 |

The differences, 2.9 per cent is not large, but seems to indicate slightly more very poor families in the northeast in 1960 than in the West. On the other hand, a classification of household social status

by the dwelling unit indicator shows a larger lower status group in the west and a larger upper status group in the northeast:

| | *Northeast* | *West* |
|---|---|---|
| Lower social status (Bamboo, sawali, nipa cogon materials) | 54.8 | 61.0 |
| Middle status (Mixed materials) | 39.9 | 30.9 |
| Upper social status (Stone, concrete, bricks, wood, stucco, etc.) | 5.3 | 8.1 |
| | 100.0 | 100.0 |

These data show a similar but slightly lower median social status in the west, brought out more clearly by dichotomizing the data into two groups, upper and lower social status, by combining middle and upper status groups:

| | *Northeast* | *West* |
|---|---|---|
| Lower Status | 54.8 | 61.0 |
| Upper Status | 45.2 | 39.0 |
| | 100.0 | 100.0 |

Occupation is reported by municipality in the 1970 Census report for Misamis Oriental (Table II-6, p. 26).

The Census furnishes the following large categories:

| | *Agriculture, Hunting, Fishing, Logging, Forestry, etc.* | *Services* | *Manufacturing* | *Commerce* | *Transp., Communication* | *Construction* | *Utilities* | *Mining, Quarrying* | *Other NEC*[a] | *All Occup.* |
|---|---|---|---|---|---|---|---|---|---|---|
| West | 75.1 | 6.7 | 5.0 | 5.5 | 2.4 | 4.3 | 0.4 | 0.2 | 0.4 | 100.0 |
| Northeast | 72.6 | 11.2 | 5.7 | 4.9 | 2.6 | 2.2 | 0.0 | 0.0 | 0.8 | 100.0 |

[a]Not elsewhere classified

Clearly the outdoor occupations of agriculture, hunting, fishing, logging, and foresty were the principal avocations of both populations in the 1960-69 decade, measured by the 1970 Census enumeration. Of these, relatively few are occupied mainly in logging, fishing, hunting and forestry. By far, the greatest number are engaged in agriculture. The people of both segments are overwhelmingly of the same Ethnolinguistic cultural group, Cebuano, Bisaya speakers. Ninety-six (95.6) per cent spoke this language as their mother tongue in 1960 (Table 1-2). The largest percentage of in-migrants since birth had come from Bohol (31.5 per cent) and from Cebu (21.8 per cent) as the 1960 Census shows (Misamis Oriental, Table 1-2).

Average farm size was larger in the northeast in 1960 as also percentage of owners (*agriculture, Misamis Oriental,* Tables 1 and 4):

| | *Northeast* | *West* |
|---|---|---|
| Mean Farm size | 4.5 | 3.0 ha. |
| Percent farms tenant-operated | 18.3 | 29.6 |
| Hundred of hectares, tenant-operated, percentage of total | 12.5 | 20.5 |

The three main crops in Misamis Oriental in 1960 were coconuts, rice, and corn. More farm area was devoted to coconuts and to palay in the northeast and less to corn in the northeast (Tables 1, 4, 10). The significance of these facts is that rice commands a substantially higher price and yields a greater production per hectare than (shelled) corn, while copra and other coconut products, e.g., tuba (a coconut liquor derived from the fermented juice of the flower of the coconut), find a ready market from purchasers who travel through the area. Per cent of farm area devoted to these crops was:

| | *Northeast* | *West* |
|---|---|---|
| Coconuts | 43.0 | 37.1 |
| Corn | 11.8 | 30.3 |
| Palay | 5.7 | 2.2 |
| | | 69.6 |
| Other Crops | 39.5 | 30.4 |
| | 100.0 | 100.0 |

The planting of corn or rice is not an arbitrary decision. Paddy rice demands an abundant water source while the soil must contain enough clay to hold the water during the growth period of the young rice shoots. Upland rice also demands conditions not required by corn. Corn is not valued as highly as rice for food by the people, and is sold at lower prices in the market.

Average production and value is given in the Census for these crops (Tables 10, 13). Computing a mean value from these data per hectare invested, the RIMCU researchers estimated a per hectare value for 1960 crops for northeast and west.

| *Northeast* | *West* |
|---|---|
| ₱226 | ₱190 |

*Summary of Census Data*

These data show the similarity of northeastern and western segments in language, culture, education, occupation, main crops, social characteristics, farm tenure, farm size, income and fertility. If either segment seemed slightly advantaged over the other, it was the northeast (higher educational achievement, higher mean income, higher social status, large average farm size, and lower rates of tenancy). Thus it seems logically defensible to use the northeast segment as a quasi-before area from which to measure the extent of change in the west associated with its electrification by the MORESCO I electric service cooperative. In short, the northeast data will be used as benchmark data. It will be assumed that changes in the western segment, unlike those which occurred in the northeastern segment, should be associated with the electrification effected by the MORESCO I cooperative, if it can be shown that no other sufficient reason seems to be operative which did not produce similar results in the northeast.

*Sample Design*

The study is a two-stage, stratified PPS sample survey with regard to the household data. Community-level data were gathered on a hundred per cent basis for municipal poblacions and in all

sample barrios selected. Household respondents were male and/or female heads of households for the household data, and were the mayors or any responsible and knowledgeable municipal officer in municipal poblacions, and the barrio captain, the vice barrio captain, or any responsible and knowledgeable barrio official or adult resident.

The household sample is fairly large because some material to be asked was detailed and smaller samples would have resulted in too many empty data cells. Altogether 3,469 households were interviewed, 1,224 in the non-electrified northeast and 2,245 in the electrified west. The larger sample in the west was dictated by the primary interest in that segment.

Explicit clusters were the northeast and the west. Fifty clusters were drawn in each segment from the complete list of barrios and poblacions or poblacion barangays (where such information was given in the 1975 Census) by systematic sampling after a random start.

In the second stage, 24 households were ideally to be selected from each northeastern sample cluster, and 50 from each western cluster. Actual number of households interviewed depended of course upon the ration of the Census enumeration total of households for the particular cluster and the actual number found there at time of interview, as per ordinary PPS sampling procedures, in order to preserve the second stage sampling fraction. Probability of selection of each household was approximately $7.1 \times 10^{-4}$ in the northeast and $1.9 \times 10^{-3}$ in the west. Median dates of interview varied by about nine months because it was desirable to analyze the northeastern data in order to further refine the interview schedule for use in the west. These dates were September 11, 1978, for the northeast, and June 5, 1979, for the west. The sample included approximately 2.9 per cent of the households of the northeast and 9.6 per cent of all western households. Population sizes were estimated at 200,500 persons in the northeastern segment and at 132,595 in the west on the appropriate median dates of interview.

Seven schedules were developed to obtain the data. One household schedule for the northeast and two for the west. And one barrio and one poblacion schedule each for neortheast and west.

Data were kept comparable but analysis of the northeastern data allowed western data to be more extensive and penetrating. Because the number of questions had grown rather large, these were segmented into two sections – one for interview with the male head of household, and one for his wife or mother. Where a woman was the household head, data on both schedules had to be obtained from her.

*Hypotheses*

Hypotheses of the present study are:

1. The growth rates of the two Provincial segments are differentially affected by net migration associated with the electrification of the western segment and the non-electrification of the northeastern segment.
2. The total cash annual incomes of the two segments are differentially distributed and the differences are positively associated with electrification of the area.
3. Relatively more currently married women are employed in non-family business in the west, and this employment is farther from home.
4. Married women in the west are more satisfied with work than in the east.
5. Relatively more large business is found in the western than in the eastern segments.

The movement of peoples does not take place without motivation. Migration is commonly believed to take place in response to sets of "push" and "pull" characteristics. Push characteristics would be those influencing people to move away from a locality or an area, some of which characteristics might be difficulty in obtaining farm land for one's own use, low wages, or lack of economic opportunities. On the other hand, pull characteristics would be those attracting persons to the area, such as ree land opened for settlement by the government, high wages, and good opportunities for employment appropriate for one's level of training and ability.

The assumption of the first hypothesis is that off-farm, non-family enterprise was meager in both segments for both sexes before the electrification of the western segment. The distributions by occupation already presented, drawn from the 1970 Census data, indicate the factual correctness of this presumption. In the Sociological Convention paper, an endeavor was made to show that business and other enterprise had started up in the western segment after electrification and presumably because of the illumination and power the electrification provide. Assuming this material at the present time, one may ask to what extent, if any, the substantially increased employment opportunities of the west and the lack of such opportunities in the northeastern segment had impact upon population size and distribution in both segments.

A first response to this question is to offer percentage data from the distribution of populations at median dates of interview in both segments.

| | *Northeast* | *West* |
|---|---|---|
| Ages 0-9 | 33.2 | 31.3 |
| Ages 10-49 | 57.4 | 59.9 |
| Ages 50 and Above | 9.4 | 8.8 |
| | 100.0 | 100.0 |

This table reveals that relatively more men and women of working ages, 10-54, were found in the west than in the northeast. Examining this finding more carefully, one finds that the same is true of each five year age group of the working period 10-49 years of age except age 40-44 which were the same, and ages 35-39 where relatively more persons were found in the northeast. The one-tailed probability of this occurring by change is .063. which is close enough to .05 to suggest this is no chance result.

| *Age* | *Northeast* | *West* | *Age* | *Northeast* | *West* |
|---|---|---|---|---|---|
| 10-14 | 14.2 | 14.7 | 35-39 | 5.3 | 5.0 |
| 15-19 | 11.7 | 12.0 | 40-44 | 4.5 | 4.5 |
| 20-24 | 7.4 | 8.0 | 45-49 | 3.5 | 4.0 |
| 25-29 | 6.1 | 6.5 | | | |
| 30-34 | 4.7 | 5.2 | | | |

Secondly, more older persons, 50 years of age and more were found in the northeast, as well as more children below age 10. All these characteristics suggest net out-migration from the northeast and net in-migration into the west. In migrations, it is usually persons of working age who migrate. Older persons remain or are left in the place of origin, and younger children tend to be left with relatives. The patterns of these data both for place of origin (northeast) and place of destination (west) of net migrations support the hypothesis of net out-migration in the northeast and of net in-migration in the west.

Another aspect is population size. Fertility is relatively high in both segments and death rates moderately low – perhaps 10-11 deaths per thousand per annum. Household totals for each segment given in the 1970 Census were 33,650 for the northeast and 20,740 in the west. On median data of interview 34,323 households were estimated to be resident in the northeast and 23,281 in the west. From these data by the exponential function, rate of increase was estimated at 0.6 per cent per annum in the northeast and 2.8 per cent per annum in the west. Clearly, the northeastern natural increase should be much higher per annum, perhaps 35 births per thousand less 10 deaths per thousand or 2.5 per cent per annum. The indication therefore is net out-migration. The west may have had somewhat lower fertility as data to be analyzed eslewhere is expected to indicate. Thus net in-migration since 1975 is probable.

In addition to these estimates of net migration in the two areas, several direct questions were asked in the west of currently married women respondents 15-49 years of age. The first of these inquired about place of birth. The response showed that more than half had migrated into their present barangay of residence (55.8 per cent).

However, most of these migrants (59.6 per cent) had been born in the western segment in a different barrio or poblacion. Thus only 40.4 per cent were migrants from outside the western segment.

The following percentage table breaks down this 40.4 per cent (or 22.5 per cent of all households) by the last place where they had lived for as long as 12 months before in-migration.

| | |
|---|---|
| 1. Misamis Oriental outside the western segment | 20.5 |
| 2. Elsewhere in Mindanao | 41.8 |
| 3. One of the Visayan Islands | 35.9 |
| 4. Manila | 0.5 |
| 5. Elsewhere in Luzon | 1.0 |
| 6. No response | 0.2 |
| All Migrants from Outside Segment | 100.00 |

All migrants were asked their reason for migration. The percentage response is illuminating:

| | | |
|---|---|---|
| 1. I had married and came to live here where my husband resided | | 46.2 |
| 2. For reasons connected with work | | 29.6 |
| a. Husband seeking work here | 14.3 | |
| b. I was seeking work here | 6.9 | |
| c. He (and/or I) had found work here | 2.1 | |
| d. My husband assigned to work here | 6.3 | |
| 3. We had bought/obtained land here | | 0.6 |
| 4. We had relatives here | | 6.4 |
| 5. To send children/go ourselves to school | | 0.6 |
| 6. The peace and order situation | | 2.6 |
| 7. We had transferred our residence here | | 3.8 |
| 8. No response | | 0.2 |
| All migrant respondents | | 100.0 |

In these data, the influence of employment opportunity is shown clearly to be large. Thirty (29.6) per cent had migrated into the area because of work attractions, of all those who had in-migrated into the western segment.

A further migration question was addressed to these respondents in order to associate better their migration with electrification of the area. It was during 1970 that the infrastructure necessary for supplying the electric current (towers for the high tension wires, transformers, poles and wiring for the local lines, buildings, etc.) was

more visibly put into place. Respondents were therefore asked the year of their in-migration.

Of all in-migrant respondents, a full 45.8 per cent had in-migrated after the beginning of 1970.

Thus a strong case can be made for the influence of electrification as a stimulant of employment upon the population movements into the western segment and out of the northeastern segment. Forty-one (40.6) per cent had migrated into the area, and of these, 20.5 per cent, that is, 4.6 per cent of all western households, had come from other parts of Misamis Oriental. The various pieces estimated are:

| | |
|---|---|
| Relative | 10,290 |
| From other barangays, west | 7,743 |
| From elsewhere in Misamis | 1,076 |
| From elsewhere | 4,172 |
| All Respondents | 23,281 |

Why did these people, including those from northeastern Misamis Oriental migrate here? The answer of 29.6 per cent (3,845 respondents) was "for employment reasons".

When did these employment reasons begin to become more attractive in the west than the northeast? Why did the northeast not attract as many migrants and hold its own residents better? The Census data already seen for 1970 indicate little employment outside agriculture in either northeastern or western segments. And 45.8 per cent of all migrants to the west (5,950 respondents) had come after the start of 1970, when electrification was already attracting business into the west. The data appear to show that electrification was the reason. The only other large change in the area (other than martial law and inflation) was a new concrete road from Iligan City to Butuan City, affecting both segments equally and not opened up until late 1978 – too late to affect employment results appreciably in either segment by June 1979.

The conclusion seems justified that the electrification infrastructure has been associated with the net in-migration in the west and the net out-migration in the northeast. A moderately strong case

for the causal influence of electrification upon migration can be made in view of the quasi-before and quasi-after aspects already described.

*Distribution and Medians of Annual Cash Income*

The second hypothesis was concerned with the distribution of income and its positive association with electrification.

As previously noted, income seems to have been higher in the east than west, on the basis of the value of principal crops of agriculture, which was by for the chief occupation in both segments.

The following annual cash household distribution in percentage permits examination of this hypothesis.

| | *Northeast* | *West* |
|---|---|---|
| Below ₱2,000 | 45.9 | 37.9 |
| ₱2,000 - 3,999 | 24.3 | 22.1 |
| ₱4,000 - 5,999 | 15.8 | 14.4 |
| ₱6,000 - 7,999 | 5.3 | 9.3 |
| ₱8,000 - 9,999 | 2.1 | 4.8 |
| ₱10,000 or more | 6.5 | 11.5 |
| All incomes | 100.0 | 100.0 |
| Total Households (est.). | 34,320 | 23,280 |

The table shows clearly higher income in the west. For each "low" income bracket up to ₱6,000 as the upper limit, smaller percentages are found in the west than in the northeast.

Quartiles, medians, and averages bring out the differences more clearly. Values are rounded to the nearest peso from the original grouped data (in thousands of peso categories).

| | *Northeast* | *West* |
|---|---|---|
| First Quartile | ₱1,126 | ₱1,161 |
| Median | ₱2,287 | ₱2,970 |
| Third Quartile | ₱4,457 | ₱5,103 |
| Mean | ₱3,185 | ₱4,090 |

These summary measurements show that in each of the three quartiles including the median, income was higher in the west. Mean income was also higher in the west.

The data however are shown in reported totals. Since the two interview medians were approximately nine months apart, western segment income is reported for a later data during a time of inflation. One might object that the differences therefore may be due entirely to inflation.

To examine this possibility the quartile and mean values of the western segment were projected backwards by the compound interest formula (which is more appropriate here than the exponential function). Results are compared below in terms of September 1978 pesos. Rate of inflation was taken from the average rate, 1972-1979, published by the Regional Census Office, Region X (1979: Table 1), at 14.82 per cent per annum.

| | *Northeast* | *West* |
|---|---|---|
| First Quartile | ₱1,126 | ₱1,049 |
| Median | ₱2,287 | ₱2,684 |
| Third Quartile | ₱4,457 | ₱4,612 |
| Mean | ₱3,185 | ₱3,696 |

The data when so treated show less but still substantial, differences between northeastern and western incomes. It appears that in the west persons with incomes in the lowest 25 per cent are less advantaged than the other quartiles. Perhaps these persons are chiefly those living in isolated areas which cannot be reached by the MORESCO power lines or others who for some reason cannot take advantage of the new opportunities. These types of persons represent one of the serious dysfunctions of such an infrastructure. Persons who cannot enjoy the benefits of electrification may drop further below the median and mean than ever before. National and municipal governments would be well advised to keep alert for such an outcome, and attempt to provide some means for such categories of persons to "catch up" with the more advantaged population segments. One such means might be the financing, whole or partial,

municipal) of the children of such families to continue primary education in the municipal centers, and even to continue through high school if their school grades warrant this.

The interquartile range is important as by definition it includes half the households studied. Although the first quartile value is lower in the west, the median value makes clear the fact that although not the entire half of the western households are advantaged over the northeast, still the majority of them are so advantaged.

The second hypothesis then is taken as supported by the data, first because incomes appeared higher in the northeast before the installation of the MORESCO I infrastructure, and secondly because income in terms of constant September 1978 pesos was higher in the west.

*Employment of Women*

The third hypothesis is that relatively more currently married women would be found employed in non-family business in the west, and that such employment would be farther from home. The reasoning behind this hypothesis was that if the employment of currently married women had increased dis-proportionately in the west because of the increase in business and other non-family enterprise, the chances were that such employment, on the average, would probably be farther away from home than family business, which presumably would be more typical of the northeast, which had no wide coverage electrification with which to attract business enterprise.

A question upon occupation of currently employed and currently married women 15-49 years of age was taken as first indicator for this question. It provided data to begin study of this question. The percentage categories which resulted were:

| *Categories* | *Northeast* | *West* |
|---|---|---|
| 1. Professional or paraprofessional | 12.8 | 18.3 |
| 2. Business and industrial enterprices | 0.5 | 4.8 |
| 3. Minor government work | 0.5 | 0.0 |

| *Categories* | *Northeast* | *West* |
|---|---|---|
| 4. Sales work | 65.7 | 66.4 |
| 5. Crafts and industries | 7.1 | 3.5 |
| 6. Agricultural work | 8.2 | 0.9 |
| 7. Hairdressing, etc. | 1.1 | 1.3 |
| 8. Sports and entertainment | 0.0 | 0.5 |
| 9. Domestic work | 4.1 | 4.3 |
| All Occupations | 100.0 | 100.0 |
| (N) est. | 5,470 | 2,440 |

Actually, not a large proportion of women by comparison with men, were currently employed. The ratio of currently married, currently employed women, 15-49 years of age, to all currently married women at median date of interview was 23.3 per cent in the northeast and 8.6 per cent in the west. (The ratio of employed males to all males 15-59 years of age was 92.0 per cent in the northeast and 88.9 per cent in the west. The ratio of males employed in agriculture to all males 15-59 years old was 70.8 per cent in the northeast and 45.4 per cent in the west).

Examination of the table reveals that many of the "jobs" under sales work were not substantial. A break down of this category is:

| | *Northeast* | *West* |
|---|---|---|
| 1. Wholesale and retail trade | 2.1 | 1.7 |
| 2. Commercial travellers, "Dealers | 1.0 | 0.4 |
| 3. Vendors, peddlers, petty trade | 62.6 | 64.3 |
| | 65.7 | 66.4 |

Vending, peddling, and petty trade are mostly very unsubstantial jobs, like selling sweepstake tickets, selling foodstuffs as hucksters, and peddling. If one eliminates agricultural work, as having little to do with electrification or its absence, the remaining more substantial jobs are:

| | *Northeast* | *West* |
|---|---|---|
| 1. Teachers | 12.3 | 15.7 |
| 2. Medical workers | 0.5 | 2.6 |
| 3. Administrators, executives, and managers of enterprises | 0.0 | 0.9 |
| 4. Accountants | 0.0 | 0.4 |
| 5. Bookkeepers, cashiers, accounting clerks | 0.0 | 0.9 |
| 6. Stenographers, typists | 0.0 | 0.5 |
| 7. Office machine operators | 0.0 | 0.4 |
| 8. Packers and labellers | 0.0 | 0.4 |
| 9. Clerical workers, business, and minor government workers | 1.0 | 1.3 |
| 10. Wholesale and retail trade, commercial travellers, and "Dealers" | 3.1 | 2.1 |
| 11. Manufacturing | 0.5 | 0.0 |
| 12. Carpentering, cabinet making | 0.0 | 0.5 |
| 13. Tailors, dressmakers, sewers, embroiders, etc. | 5.1 | 3.0 |
| 14. Weavers | 1.0 | 0.0 |
| 15. Nipa square makers | 0.5 | 0.0 |
| 16. Sports, entertainment | 0.0 | 0.5 |
| 17. Domestic work | 4.1 | 4.3 |
| 18. Hairdressers, etc. | 1.1 | 1.3 |
| More Substantial Employment | 29.2 | 34.8 |

Thus, out of all employed females, 29.2 per cent in the east and 34.8 per cent in the west, appear to have work capable or producing substantial income.

The second indicator is a question which endeavored to separate family from non-family business. The data are for all currently married and currently working respondent women 15 years of age or older in the northeast, and 15-49 years of age in the west. Thus the data are not perfectly comparable. Results were:

| | *Northeast* | *West* |
|---|---|---|
| 1. Working in family business | 46.2 | 72.8 |
| 2. Working in non-family business | 53.8 | 27.2 |
| All Currently Working Married Women | 100.0 | 100.0 |
| N(est.) | 5,470 | 2,440 |

Thus contrary to the hypothesis, more women were working in non-family business in the northeast. On the basis of the data previously submitted, it seems likely that much of this eastern non-family business is agricultural, e.g., harvesting tomatoes, or sales e.g., selling sweepstakes tickets.

A third aspect of the third hypothesis was distance of work from home. This was anticipated to be greater in the west. Results were:

| | *Northeast* | *West* |
|---|---|---|
| 1. Work at home | 55.4 | 40.9 |
| 2. Less than 300 m. away | 13.3 | 26.0 |
| 3. 300 to 999 m. away | 8.2 | 11.1 |
| 4. A km. or more away | 23.1 | 22.1 |
| All distances | 100.0 | 100.0 |

Interpretation of the data present some difficulties. In fact, more northeastern women work at home which supports the hypothesis. And the difference, 14.5 per cent, is substantial.

However, almost the same percentage work within 300 meters of home, 68.7 in the northeast and 66.9 in the west. Working within 300 meters of home seems almost equivalent to working at home.

Beyond 300 meters and up to 900 meters, one is out of sight and hearing of home and children. This may be taken as far enough away to require some home arrangements and to affect child care. Here relatively more western women are found than northeastern women.

On the other hand, close to the same proportion work more than 300 meters from home, 31.3 to 33.2 per cent.

The data therefore do not support the third hypothesis. They do not show that more currently married, currently working women work away from home and in non-family business. However, future research would do well to sharpen their questions so as to be able to segregate off less substantial types of work so that more precise conclusions might be reached.

*Satisfaction with Work*

The indicator of work satisfaction experienced by north-eastern women for this fourth hypothesis was the reasons why work was terminated by those who had ceased to work.

The data were:

| | |
|---|---|
| 1. Business failed/ceased | 0.9 |
| 2. Most women workers were laid off | 0.8 |
| 3. Got married | 61.9 |
| 4. Husband/family did not want me to work | 0.8 |
| 5. Because pregnant | 2.5 |
| 6. Had to care for the children | 2.6 |
| 7. Personal reasons | 0.8 |
| 8. Other reasons | 28.8 |
| 9. No response | 0.8 |
| All response | 100.0 |
| N(est.) | 3,310 |

These data appear to indicate little dissatisfaction with the job, and - other than the small percentage for personal reasons – appear to indicate that the respondent would have continued at it if some constraint from husband, children, or family had not prevented her.

However, data from the western segment pry more deeply into this question. Currently working married respondents 15-49 years of age were asked whether work made their family burdens substantially heavier. The reply was:

| | *Non-Family Employment* | *Family Business* |
|---|---|---|
| Yes | 20.3 | 21.6 |
| No | 79.7 | 78.4 |

The second set of response is almost identical. But substantially more women engaged in non-family business felt that their family burdens were heavier because of their work. It seems likely that being away from home was associated with this reaction. Non-family businesses tend to be away from home in general.

The fourth hypothesis does not appear to be supported by the data except in the sense that more western women are engaged in family than in non-family business. This however was not the reasoning behind the hypothesis. The data really do not present much evidence either for or against the hypothesis. It needs resharpening and further study.

*Large Enterprise*

The fifth and last hypothesis to be studied in this paper was that relatively more large businesses or other enterprises would be found in the western than the northeastern segment. This hypothesis was generated by the requirements of most large businesses or industries for electric light and power, which were available only in the western segment, unless self generated.

The data are as follows:

| *Northeast* | *Employees* | *West* | *Employee* |
|---|---|---|---|
| Anakan Lumber Co. | 300 | Tipi Lumber Yard | 400 |
| Mindanao Plywood Corp. | 300 | Electro-Chemical Factory | 200 |
| Kabulig Food Production and Supplier | 110 | Mindanao Steel Corp. | 112 |
| Klin-Dry Factory | 60 | Meijo-Philippines | [100]* |
| Granexport, Inc. (Rice) | 20 | Floro Portland Cement | 90 |
| Dy Warehouse (Copra) | 15 | Electro-Alloy Factory | 80 |
| All Listed | 805 | Mabulay Agro-Forestry Corp. | 45 |
| | | Fishing Corp. of Sil. | 30 |
| | | Sy Trucking Corp. | 30 |
| | | Emergency Hospital | 28 |
| | | Community Hospital | 14 |
| | | All Listed | 1,029 |

*Not included. Failed 1978.

The enterprise of the northeastern segment is extractive and agricultural. The Anakan and Mindanao Plywood companies are located near the source of timber supply. They manufacture their own electricity, which Minply supplies also to Klin-Dry, one of its divisions. Kabulig Food is an agricultural enterprise and most of its employees are agricultural, laborers working on crops, e.g., tomatoes. Granexport is a large wholesale establishment, and the Dy Warehouse deals in copra.

As against this, the western segment has or has had several similar enterprises. TIPI is a log pond and lumber yard establishment, Meijo-Philippines was an agri-business producing sorghum for shipment and sale to Japan, and so is the Mabulay Agro-Forestry Corporation. The west however also has several strictly industrial type operations the northeast does not include. These are an electro-chemical factory, an electro-alloy factory, the Mindanao Steel Corporation, which produces galvanized iron roofing, a trucking concern, and two hospitals (which opened after and because of the electric power and light in Initao Municipal Poblacion.)

Thus the data support the hypothesis that relatively more larger businesses and enterprises would be found in the western segment. These data show a greater attraction for industrial type enterprise to the electrified area in preference to the non-electrified eastern segment. The hydroelectric nature of the MORESCO I electricity enhances this attraction because it is cheaper per unit than diesel-based power. With the inflation of oil prices, this factor will increase in importance.

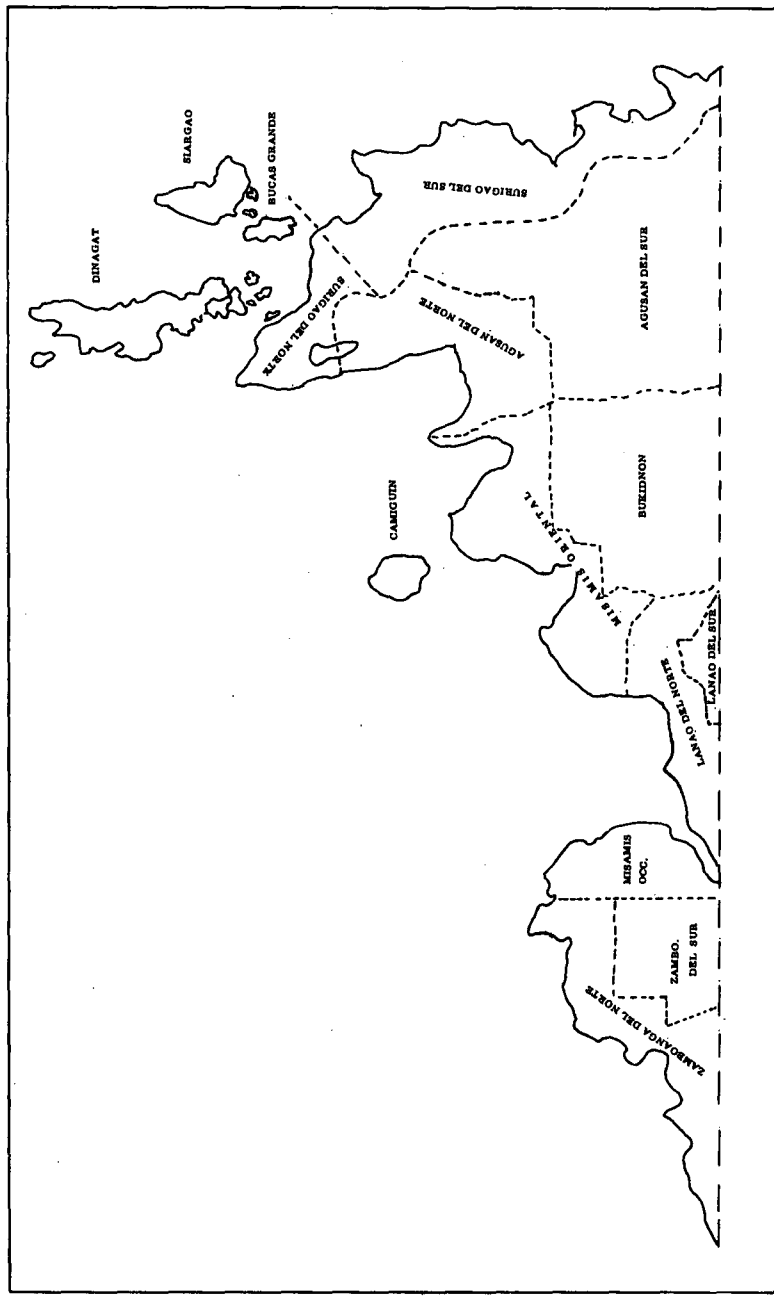
## SUMMARY

This paper has examined population and household data from two segments of Misamis Oriental Province in an attempt to trace some of the forces making for change in population size and characteristics. It has attempted to relate such changes to the differential employment situation in northeastern and western Misamis Oriental hypothesized to be associated with a rural electric service cooperative, MORESCO I, which has been supplying hydroelectric current to cooperative members since 1971.

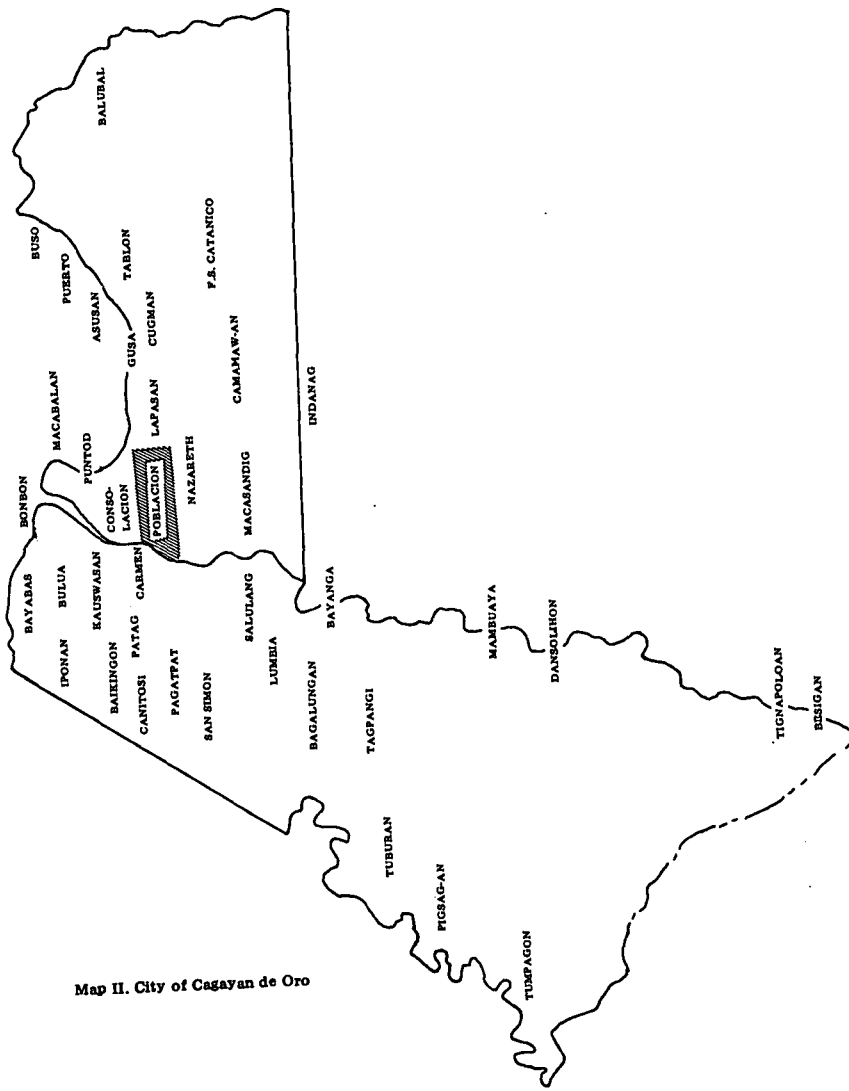
Five hypothesis, pertaining to growth rates and net migration, to total cash income, to the extent of employment of currently married working women and the distance from home of their work places, the work satisfaction of these women, and the presence of large enterprise, were tested in connection with the main thrust to study the population effects of development infrastructure.

The Hypothesis on growth and net migration, upon income, and upon the presence of large enterprise were supported by the data. Those upon the participation of currently married women in the labor force in places farther from home, and upon the work satisfaction of these women were not supported by the data.

It would be desirable to carry out further study of the effects of developmental infrastructure upon population size and composition. Too often concepts upon the effects of such infrastructure are based upon speculation rather than actual data. Such studies too would supply planning boards and policy makers with data to choose between different items to be included in development "packages". It may even not be premature to begin studies of the socioeconomic effects of such "packages", rather than of the single items among them.




Map I. North Coastal Provinces of Mindanao, Southern Philippines.




Map II. City of Cagayan de Oro

Map III. Province of Misamis Oriental