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INTRODUCTION

Modern views of the state accord closely with the position of neo-Thomist philosophers that the goals of the state are the common good of all the citizens, their prosperity, the maintenance of order and social tranquility in the society, and the protection of the citizens from foreign threats and invasion. It thus appears reasonable to evaluate the effects of governmental input such as the Bukidnon sugar production facilities in terms of the benefits these have brought to various social categories of the population directly affected by them as well as to the larger society in general. This article presents the results of an investigation carried out in late 1982 and early 1983 on the Bukidnon sugar industry and its effects on the province of Bukidnon.

THE SUGAR INDUSTRY

The Bukidnon sugar industry may be viewed as consisting mainly of two parts: the Bukidnon Sugar Milling Company, Inc. (BUSCO as it is more popularly known) with its facilities, and the sugar planters who have set up an organization to assist them in their enterprise; the Bukidnon Planters' Association (also called the BPA); both entities have their headquarters in Butong Barrio,

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Quezon Municipality. The BPA was organized in September 1974, at the Manila Golf Club, and was registered with the Securities and Exchange Commission in December 1976. The BUSCO was set up in 1974 with the assistance of a ₱50 million credit from the Marubeni group of Japan, and included among its stockholders and incorporators many of the former large ranchers of Bukidnon Province who were permitted by the government to convert their leased ranchlands into sugar plantations where the soil was fertile enough for such a crop. Among such persons or enterprises participating were members or representatives of the Africa, Escaño, Fortich, Montalban, Nieto, and Ozamis families or interests.

Sugar is grown in appreciable quantities in thirteen of the twenty-two municipalities of the 1980 Census. These are Damulog, Dancagan, Don Carlos, Kadingilan, Kalilangan, Kibawe, Kitaotao, Lantapan, Malaybalay, Maramag, Pangantukan, Quezon, and Valencia. However, it is grown more intensively in the municipalities closest to the sugar mill, Quezon, Valencia, Maramag, and Don Carlos. The mill gives a transportation subsidy for distances up to a maximum distance of 20 kilometers from the mill (₱1.50 per ton of cane per kilometer), but after 20 kilometers the subsidy remains constant at ₱30 per ton. Figure 1 presents a map of the sugar localities (shaded portions).

The area planted to sugar cane has increased over the years since the mill began its operations. It has been the most efficient in production performance of all nine sugar mills (centrals) in the country with a milling capacity of four thousand tons of cane per day, from the 1979-80 crop year through 1981-82 (after which it upgraded its capacity to 6,000 tons of cane per day). The target hectareage the mill and the planters hoped would be dedicated to sugar in 1983 was 20,000 hectares. Table 1 shows this increase in hectareage devoted to cane, as well as tons of sugar cane milled, and piculs of sugar produced. (A picul, as defined in the Philippine sugar industry, is 63.25 kilograms, or 139.44 lbs., of sugar.) One will note that while piculs have increased in absolute quantity from year to year, they have declined relative to number of tons milled, from crop year 1978-79 onwards. This indicates that further gain can be made on the same hectareage, with better cane selection for seeding, with less "ratooning," i.e., leaving a portion of the stalk underground for the next

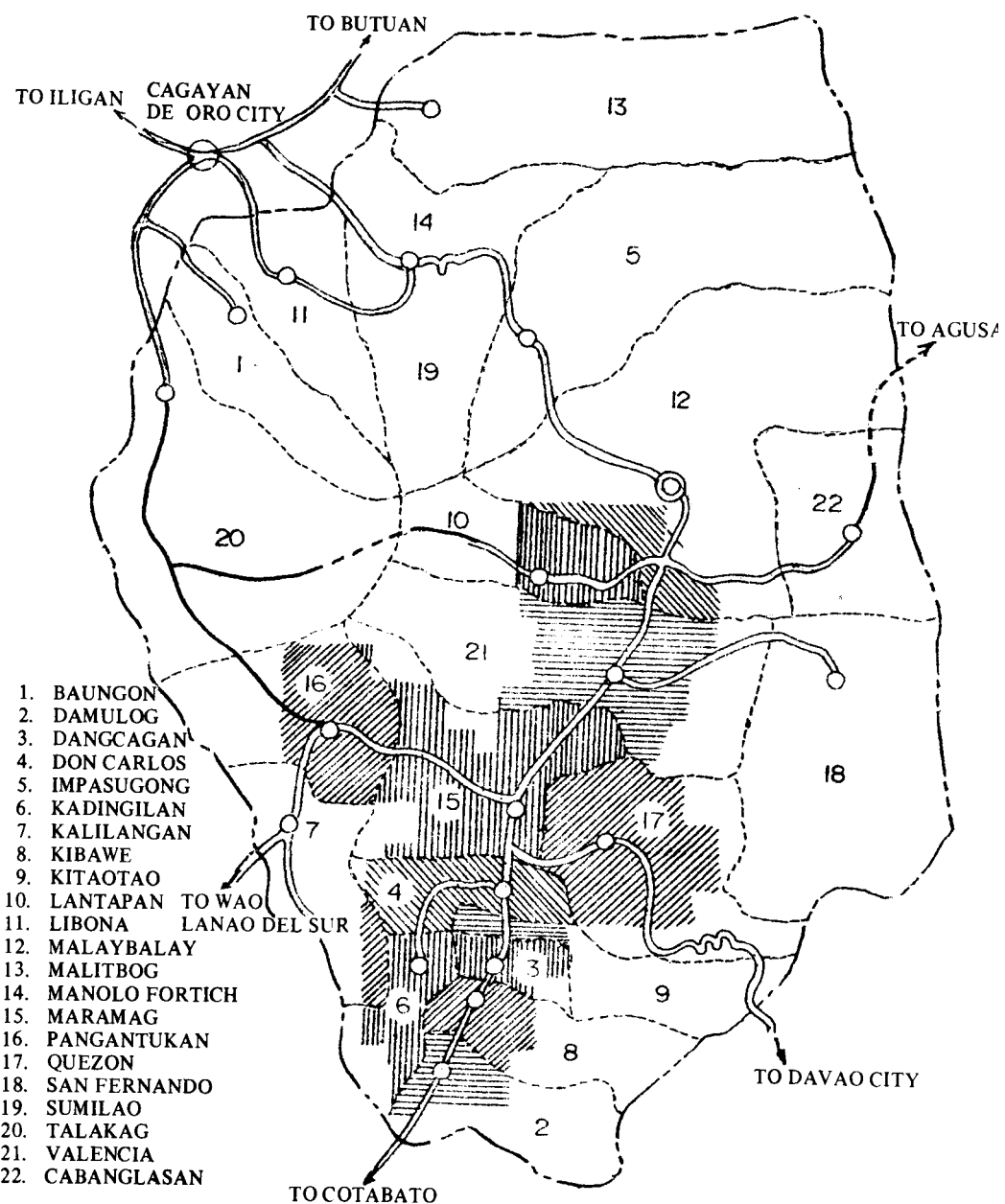


Figure 1. The municipal areas of Bukidnon and their participation in the BUSCO Sugar Mill Production (represented by shaded areas)

Table 1. Area Planted to Sugar Cane, Tons of Cane Milled, Piculs of Sugar Produced, and Piculs of Sugar Per Ton of Cane Milled and Per Hectare Planted, Crop Year 1976-77 to Crop Year 1981-82.

Crop Year	<i>Ha. Planted</i> (000s)	<i>Tons Milled</i> (0,000s)	<i>Sugar, Piculs</i> (00,000s)	<i>Piculs Per</i> <i>Ton Cane</i>	<i>Piculs Per Ha.</i>	<i>Tons Cane</i> <i>Per Ha.</i>
1976-77	1.9	14.9	2.6	1.75	133.5	76.3
1977-78	3.7	25.4	4.6	1.82	125.4	68.8
1978-79	5.5	39.4	7.3	1.84	132.4	71.8
1979-80	8.4	54.5	9.9	1.82	117.5	64.5
1980-81	12.4	76.0	13.4	1.76	107.7	61.3
1981-82	16.2	89.5	14.9	1.66	91.9	55.2

Source: *Fifth Annual Report*, 1981-82 Bukidnon Planters' Association, pp. 26-27.

harvest and with continuous inspection of the milling machinery and apparatus to maintain optimum outputs. Of course, profitable trade-offs must be likely for such further investment to prove attractive to these farmers and enterprises. A more rapid decline is noted in piculs of sugar per hectare planted, and in tons of sugarcane per hectare.

With regard to these declines, the greater the amount of land devoted to sugar from year to year, the larger the percentage of more marginal and less productive land among those dedicated to sugar crops is likely to be. This factor alone could have a strong dampening effect upon production of sugar per ton of cane and per hectare. However, offsetting efficiencies are also possible in terms of insect and weed control, and through choice of better cane species used as seed cane. Whether the expense of such inputs can be justified must be determined in terms of investment costs and returns to such investment. A way of exploring this outcome might be to grant a partial subsidy to a planter or planters over several years to study the returns of such investment on his land to income. Victorias Milling Company has in the past invested considerable funds in cane sugar research, trying to develop better cane varieties for planting (insect repelling, higher yields of sugar per ton, and so forth). BUSCO, it seems, could profitably fund planter research upon the most profitable mix of inputs relative to investments. Should BUSCO be able to increase yields of sugar per ton of cane, the grant would prove to be a wise investment.

International trade in sugar includes several markets: the export market to the United States under the U.S. quota agreement, the export market to the Commonwealth countries of the U.K. Commonwealth Agreement, exports from Cuba to the socialist countries, exports from the U.S.S.R. to the socialist countries, and free-market sugar for trade. The volume of free-market sugar is much less than world production. For example, in 1969, it was only 13.8 percent of world production. Prices are usually based on spot quotations on recognized exchanges, e.g., the United Terminal Sugar Association (London) or the New York Coffee and Sugar Exchange.

The wholesale trade price of free-market sugar has fluctuated wildly in the past. For example, it was 12.6 cents per pound in U.S. currency in 1962 but in 1967 only 1.23 cents, a factor of 10.2. The present international price had recovered enough by 1981-82 to enable BUSCO to pay its planters ₱165 per picul of raw sugar or ₱1.183 per pound. Taking the 1981-82 peso-dollar exchange rate at 8.5 to the dollar, this would be approximately U.S. 13.9 cents per pound. In 1969, the U.N. Conference on Trade and Development (UNCTAD) succeeded in establishing an International Sugar Agreement which regulated the export quota for each country and set a floor price, U.S. 3.25 cents per pound.

The retail price of sugar varies greatly from country to country, principally because of differing customs duties upon raw sugar and of excise taxes upon refined sugar. For example, in 1969 while the price of sugar was U.S. 3.8 cents a pound in Mauritius, it was U.S. 16.4 cents a pound in Japan.

Several by-products of cane sugar manufacturing can be the basis of useful industries. For example, sucrose esters can be used as surface-active agents in food products; molasses is used for livestock feed, for making alcoholic drinks such as rum, and for the manufacture of monosodium glutamate by fermentation; and bagasse fiber is used as boiler fuel, and also for the manufacture of either soft or hard building board. Cane wax, which is extracted from the dried filter cake of raw-sugar factories, is used in the manufacturing of polishes, cosmetics, and paper coatings.¹

While the area devoted to sugarcane has been growing, that devoted to *palay* (unhulled rice) and corn has been diminishing,

1. *Encyclopaedia Britannica*, 15th ed., s.v. "Sugar Production," by Takeo Yamane.

although not in a one-to-one relationship. Looking at index values of area planted to corn, palay, and sugarcane, one notes opposite directions in growth for sugarcane on the one hand and for palay and corn on the other. With base year 1976 (=100) for each crop, the following patterns emerge:

	1970	1976	1977	1978	1979	1980	1981
Sugar (ha.)	21	100	189	282	434	637	832
Corn (ha.)	129	100	94	112	91	74	64
Palay (ha.)	88	100	98	95	93	71	70

Thus while the sugarcane area was growing by 732 percent from 1976-81 over its 1976 area, the area planted to corn was declining by 36 percent and the area planted to palay by 30 percent.

One should not conclude from these data that growth of the cane sugar area is solely responsible for the decline in area devoted to corn and palay. This in fact is not the case. Other plantation economies related to abaca, rubber, fruit, cassava and coffee, as well as other crops have also competed with rice and corn for farm hectarage. Other factors too have very likely entered into the decline of hectares planted to rice and corn. Among these are the withdrawal from cultivation of more marginal rice and corn lands, the low prices of rice and corn in the Philippine market (especially in view of the disadvantaged situation of Filipino small farmers in the current inflationary situation), and the deteriorating peace and order situation in the rural areas.

BUKIDNON PLANTERS' ASSOCIATION

The Planters' Association was established to protect the interests of the planters in dealings with the mill, with labor, with the government, and with others. Its growth provides an index of the attractiveness of sugar production over such rivals as corn and rice production. Membership has grown from an original fifty-four planters (as distinguished from members, not all of whom have planted and milled sugar) to 918 planters and 1083 members in 1982 (BPA, 1981-82; 14, 22), for an annual increase of planters of 60 percent per annum and of members of 65 percent per annum, by the compound interest formula. Obviously, membership and actual planting have proven attractive.

In 1981-82, 3 percent of the planters or planter enterprises controlled 45 percent of the cane sugar area, while 38 percent of

the planters controlled only 8 percent of the sugar land. The top three categories, 19.7 percent of the members, controlled 71 percent of the sugar hectareage, while the remaining 80.3 percent of the members controlled only 29 percent. One is accordingly not surprised to discover from interviews that BPA policies are rather thoroughly controlled by the top 4.9 percent of the members who control more than 50 percent of the sugar lands.

The crop value of the sugar produced by the Bukidnon planters in 1981-82 was valued at ₱246 million at an average ₱165 per picul, while the value of the 1980-81 crop at the same price per picul was ₱220 million. Ranked in terms of production of piculs of sugar, the first ten planters or enterprises grossed an estimated average of ₱7.28 million each at an average of ₱165 per picul, for the 1981-82 crop season. That is, 29.6 percent of the ₱245 million, was earned by these top ten producers. The next ten enterprises or individual planters grossed a combined ₱30,719,800, with a mean gross income from their sugar of ₱3,071,980. The final seven listed in the BPA for largest production grossed ₱13,473,100 for an average gross sugar production income of ₱1,924,728. Altogether, then, the 27 largest producers grossed ₱116,993,200, or 47.6 percent of the total gross income in 1981-82 for Bukidnon raw sugar. They did this upon an estimated 6500 to 7700 hectares of the total 16,200 ha., i.e., on from 40 to 48 percent of the area. The remaining 891 planters out of the 918, divided the remaining ₱128.6 millions of pesos in gross sugar-farm income among themselves for an average ₱144,297 income. This income was not evenly spread of course. Undoubtedly, below a certain point, economies of scale were not as possible and income per hectare would be expected to be less.

The growth in number of members of the Bukidnon Sugar Planters' Association (both planters and nonplanters), and the gross returns from the marketing of the sugar (at the mill) are strong proofs of the profitability of sugar as a crop, over several alternative crops such as corn or upland rice, although data upon the net returns from sugar production would be even more convincing. Unfortunately, however, such data are not available. However, another gauge of profitability of sugar as a crop may be drawn from community-level data, namely, from revenues paid in taxes and other government imports. Some indication of the relative value of sugar as a crop as compared with upland

rice, corn, and other crops can be gleaned from the General Fund data of Bukidnon Province,² which states the allotments for each municipality of Bukidnon, which are based upon a constant proportion of the taxes paid to the government by enterprises in that municipality. Of the ₱13.7 million in revenues for the province and for the municipalities as a whole, almost ₱4 million, 29 percent of the total, was reported for Quezon, Maramag, and Valencia, three very important sugar producing municipalities. The ₱1.7 million of the general fund for 1982 reported for Quezon was the largest of any Bukidnon municipality, including Malaybalay, the capital of Bukidnon. The total amount for the general and infrastructural funds added up to ₱2.2 million for Quezon, as against only ₱2.0 million for Malaybalay. Further, the sugar lands of Quezon Municipality had the highest assessed property value of all Bukidnon municipalities in 1982. This was ₱183 million as against ₱101 million for Malaybalay, ₱56 million for Valencia, ₱49 million and ₱30 million for Manolo Fortich and Libona, respectively, where Philippine Packing Corporation grows pineapples and other fruits, ₱48 million for Talakag Municipality where the Menzi enterprise is located, and ₱27 million for Don Carlos.

ANALYSIS OF DATA

If one assumes that residents of Bukidnon, of Mindanao, and of the Philippines in general would look upon the sugar industry in Bukidnon as an opportunity, practical or impractical in terms of their relevant situation at the planning stage of the BUSCO infrastructure and afterwards up to the time of data gathering, and would accordingly react to this opportunity positively or negatively so as to attempt to maximize both their economic standing and their social status in society, one can utilize consumer behavior theory as an analytic tool to suggest hypotheses about the impact of the sugar industry under its various aspects: the mill, BUSCO, the planters, and labor which may then perhaps be measurable in terms of the foregoing and possibly other pertinent data.

The present analysis attempts to utilize this theory to evaluate

2. Bukidnon Provincial Development Staff, "Provincial Development Investment Program (1983-87)" Malaybalay, 1982, p. 43 (mimeographed).

the effects of the sugar industry upon the Bukidnon economy. It first proceeds at the macro-level where it looks at the industry as a whole, or at large segments of it. It then examines economic effects at the micro-level of the individual household. Finally, it attempts to assess and evaluate the demographic effects of the industry.

MACRO-LEVEL ECONOMIC ANALYSIS

The hypotheses from the demand side of consumer behavior theory which guided research were:

1. The demand for sugar industry benefits in Bukidnon, particularly for augmented income and more financially rewarding employment, will be revealed by the volume of migration to the sugar areas of Bukidnon Province.
2. The demand will also be revealed by the increase in number of sugar planters from year to year during the industry's existence.
3. This demand for benefits will be mirrored in the increase of farmland area planted to sugar.
4. This demand for sugar industry benefits will appear in the production increases of sugar over the years of the industry's existence.
5. The production of corn and upland rice will decrease over the years of the sugar industry's existence, as owners put more farm land into sugar cropping.
6. The amount of farm land dedicated to corn and upland rice production will decline in competition with the area dedicated to sugar.

It is clear from the data presented previously that hypotheses 2, 3, 4, 5, and 6 from the demand side of consumer behavior theory are strongly supported by the data.

Hypothesis 1, relating to net migration into the sugar areas of Bukidnon Province because of the attractive power of the sugar industry is to some extent supported by the macro-level data. The principal problem with the macro data is the large general migration stream into Bukidnon which has transpired from 1948 to 1980 and which continues up to the present. It is difficult with the data available to disentangle migration due to expected sugar benefits and migration attributable to the general migration stream into Bukidnon.

Between 1970 and 1980, average growth in Bukidnon (414,762 inhabitants to 631,634 inhabitants) reached an annual rate of 4.3 percent. Even if the birth rate were as high as 42 per thousand and the death rate as low as 12 per thousand, the natural increase would be only 30 persons per thousand (3.0 percent). Clearly, an annual growth of 4.3 percent per annum must include a substantial portion due to net in-migration.

The annual growth rates of Butong, Bagonta-as, and Dagumba-an, 13.1, 4.6, and 11.2 percent, respectively, must also be attributed to surplus net in-migration. And the migration in each case is above the average for Bukidnon. All these barangays produce sugar. Macaopao on the other hand, a nonsugar producing barangay, had a low rate of growth which (by the same reasoning) may be attributed to surplus net outmigration. The conclusion seems to be that hoped-for sugar benefits did indeed attract in-migrants to barangays engaged in sugar production. The argument however limps somewhat. It does not explain why Dagumba-an which plants much less sugar cane per hectare of municipal land than Bagonta-as, should have grown so much more rapidly. It also does not explain the high growth rates of Impasugong and Baungon, neither of which produces sugar. Possibly, the existence of home-stead grants in Dagumba-an in certain areas still attracts in-migrants.

Further light is shed on this first hypothesis by examining the ethnicity of respondents of the sample barangays. Most migrants to southern Bukidnon previous to the sugar industry had been from Cebu or Bohol. On the other hand, BUSCO and the sugar planters have encouraged Ilongos from Negros Occidental, Capiz, and Iloilo to seek work in the sugar district of south Bukidnon. In this context, substantial presence of Ilongo residents in a sugar barangay indicates the attraction of employment benefits of the sugar industry. Ethnicity was judged by the language spoken at home, and results per 100 persons were:

	<i>Butong</i>	<i>Bagonta-as</i>	<i>Dagumba-an</i>	<i>Macaopao</i>	<i>Totals</i>
Cebuano	42	98	72	8	61.7
Ilongo	40	2	14	64	25.1
Manobo	8	0	0	0	2.3
Higa-unon	0	—	8	0	2.3
Other	10	—	6	28	8.6
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100.0</u>

A very large percentage of Ilongo residents were found in Butong, the center of the sugar industry where the mill is located and 14 percent were found in Dagumba-an. However, only 2 percent were found in Bagonta-as. And in Macaopao where sugar, if planted at all for BUSCO sale, is negligible, 64 percent were Ilongos. Ethnicity of respondent therefore did not prove very helpful in attempting to segregate migration due to anticipated sugar benefits from migration for other purposes.

These macro-level data do indicate large in-migrations into the principal sugar barangays of Bukidnon. However, they do not clarify too well the relation of this migration to the sugar industry in view of the large general migration into Bukidnon, and into other specific barangays besides those substantially involved in planting and/or processing sugar.

Another aspect of importance is whether the migration to the particular barrio took place before the planning (and resulting rumors over the "grapevine") for the construction of the BUSCO began to take place, or after this. This initial date is taken here as 1974, the year President Marcos signalled his intention of establishing a sugar mill in Bukidnon.

The data show extremely high rates of in-migration. Relatively few persons had been born in these barangays of those residing in them at the time of survey, as the totals of all migrants among residents at the time of the survey indicate. One notes that the highest migration after 1973 was into the sugar-producing barangays, Butong, Bagonta-as, and Dagumba-an as opposed to Macaopao. Further important differences appear between barangays in terms of year of in-migration. For example, only 28 percent had migrated to Butong before 1974. On the other hand 58 percent residing in Bagonta-as, 68 percent in Dagumba-an, and 76 percent in Macaopao had migrated to their new homes before 1974.

A relationship thus appears between involvement in the sugar industry and in-migration to the barangay during or after 1974. Butong where the mill is located, is the center of the industry. It also is characterized by one of the highest percentages of barangay farmland dedicated to sugar production. Bagonta-as is also characterized by a very high rate of sugar planting but of course has no facility like the BUSCO mill located in Butong. Dagumba-an is principally a homestead area of the government where (theoretically at least) industrious and energetic homesteaders could obtain complete title to their land over a period of years by their hard

work. Sugar farming came later as a possible crop, but has not been planted in more than about 30 percent of the croplands. A downward gradient in percent of migrants coming to these barangays in, or after 1974, the year in which the mill and industry were projected by President Marcos, appears to signal that attraction for migrants is linked to the barangay's degree of participation in the sugar industry.

Thus far, for simplicity, we have spoken as though anyone coming to the first three barangays after 1973, came to seek opportunities in the sugar industry. Actually, of course, that is most unlikely to have been the fact. Many other motivations must also have continued to play an important role in attracting migrants to Bukidnon, or from one to another of its barangays. Thus the maximum impact of demand for sugar benefits seems able to account for less than 45 percent of all migration into the sugar barangays. Its impact upon Bukidnon Province as a whole would undoubtedly be much less.

The data presented under macro-level economic analysis together with data presented in the first part of this article support quite strongly, in the opinion of the present author, all but the first of the hypotheses from the demand side of consumer behavior theory. The first hypothesis has received some support, principally from the community level data, but the data available are much less conclusive than those for the remaining hypotheses of the set.

From the supply side of consumer behavior theory, the hypotheses which guided research were:

1. The income of planters from sugar production will grow beyond the potential income of their land for corn or upland rice (which are the principal alternatives).
2. Labor will find a large increase in full-time employment opportunities as these are made available by the sugar industry on a large scale from 1976-82.
3. The real level of Bukidnon labor income (wages and salaries of tenants, agricultural laborers, and of mill technologists) will be found to have increased rapidly over the same period (1976-82).
4. The households of laboring men will evaluate the time since 1976 as socially and economically "better" than the times before the inauguration of the sugar industry.

5. Higher tax payments, which in general are indicators of higher planter and community income, will be found to have been made by municipalities (based upon higher taxes assessed in barrio localities with greater density of sugar production per hectare) where volume of sugar production is higher in comparison to tax payments made by municipalities with no sugar or less sugar production.

6. Foreign exchange earnings accruing to the government from Bukidnon sugar production will be substantial.

Hypotheses 1, 5 and 6 seem quite strongly supported by the data presented earlier. But, on the other hand, the data do not support the suppleyside hypotheses 2, 3, and 4.

First, it appears that labor has not experienced a large increase in full-time employment. In fact, underemployment appears to have increased in Bukidnon, at least partially as a result of the planting of sugar.

The planters claim that approximately 20,000 jobs are provided by the Bukidnon sugar industry.³ The sense of the statement relates to employment at the time it was made ("are benefitting"), rather than to the work opportunities provided altogether over the six years of the industry. The present research has not been able to verify this figure which of course does not mean that it is not accurate. The BPA employs forty-two persons during the milling season,⁴ although this figure is slightly at variance with the report of the president,⁵ who states that the BPA employs thirty regular and thirty-three seasonal workers. The BUSCO mill probably does not by itself employ many more than 2,000 full-time workers, and possibly considerably less. (We were unable to obtain statistical data on this point.) Among these would be foremen to supervise routine activities of the mill hands, technical personnel to operate, repair, and maintain the mill machinery and facilities, vehicles, office workers, other administrative staff, and executives at various levels. On its farm land, it would mainly employ field workers and various types of technicians and supervisors related to the planting, fertilizing, spraying and harvesting of the cane.

The mill industrial employees appear to be full-time workers.

3. BPA, Inc. *Annual Report of the Bukidnon Planters' Association, Inc., Crop Year 1981-82*, p. 23.

4. *Ibid.*, p. 23.

5. *Ibid.*, p. 14.

at least for the most part. The plantation workers on most sugar farms of the planters, if taken as a whole including the BUSCO plantation, seem to be mainly short-term workers, principally employed during harvest periods on various parcels of land. On any one farm this might be as long as six to ten weeks, depending upon the size of the farm and the number of workers. One of the large plantations relies principally upon human labor for the entire cane production process, and this planter also attempts to employ members of the indigenous tribe, the Manobos. Most of the others studied in 1982-83 appeared to rely heavily upon mechanized farming processes, and outside of the harvest season, to employ relatively few farm laborers on anything but a short-term basis.

Thus, if the industry does indeed in any one year employ as many as 20,000 persons, most of these jobs must be relatively short-term, for one or two months in extent. This is obviously not enough to support a farm family over the course of the whole year. Thus the statement that the industry supports 20,000 jobs a year needs to be broken down into the number of persons employed full-time, and the number provided jobs for only the harvest season or other short-term period.

It does not appear therefore that to any large extent migrants into the sugar region and other Bukidnon labor found the employment opportunities they were seeking. Persons with technical knowhow and *tapaseros* (cutters of cane) from the Negros-Panay sugar regions probably benefitted more than average persons with no previous skills.

The micro-level analysis will provide further data upon this hypothesis. From the macro-level interviews, observations, and materials, however, the research team formed the impression that the large majority of large planters have invested in mechanized equipment as much as they could to carry out the various phases of sugar production. That is, their production plans and design have been capital intensive rather than labor intensive. With the present balance-of-payments crisis and resulting difficulties in importing foreign machine parts, these planters are now likely to be regretting this approach to production, and more favorably disposed for the future toward employing more labor.

The third supply hypothesis that the real income of labor would increase as a result of the initiation of the sugar industry has also not been supported by the data. Labor's own reaction

seems to be that times are worse rather than better. Of course, not all this can be attributed to the introduction of the sugar industry. But given the capital intensive nature of sugar production in Bukidnon, and the appropriation of large tracts of land to the planting of sugar, undoubtedly the sugar industry has contributed to the failure of real income to rise in the sugar areas of Bukidnon.

The fourth supply hypothesis will be considered in the micro-level economic analysis.

MICRO-LEVEL ECONOMIC ANALYSIS

The data presented in this section were gathered on the assumption that they would provide depth and richness to the macro-level analysis with regard to the hypotheses concerned with employment opportunities, with labor income, and with labor's general position (improvement) at the time of interview. Thus they follow the general outline of the demand and supply side hypotheses of the macro-analysis section, although they may not provide further data for all hypotheses considered at the macro-level.

Occupational data upon household heads were gathered on the presumption that such data might indicate changes caused or occasioned by initiation of the sugar industry in southern Bukidnon. These data are reproduced here for whatever light they may shed upon the advantages or disadvantages to the common man from establishment of the sugar industry. In percentage form, these data were:

<i>Occupation</i>	<i>Butong</i>	<i>Bagonta-as</i>	<i>Dagumba-an</i>	<i>Macaopao</i>	<i>Means</i>
Admin/Exec.	4	0	2	0	1.5
Profess./Techn.	2	2	2	0	1.5
Sales	0	10	0	0	2.5
Crafts/Factory	34	18	0	0	13.0
Service/Entrtment	8	18	0	0	6.5
Driver/Transptn.	22	16	4	0	10.5
Business	0	2	6	0	2.0
Farming	30	32	86	100	62.0
Unemployed/Retired					
Sick	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>0.5</u>
All Occupations (%)	100	100	100	100	100.0

In fact, these data appear to show an important shift out of farming, caused or occasioned by the sugar industry. In Butong and Bagonta-as, the two large sugar-planting barangays, farming occupies less than half the proportion so engaged in Dagumbaan and Macaopao. On the other hand, the influx of professionals, technicians, executives, and administrators has apparently occasioned a demand for domestic servants and for entertainment, to an extent not found in the other two barangays. In addition, a large increase in the number of factory workers and of craftsmen (carpentry, etc.) has occurred, as well as of motor vehicle drivers and of persons otherwise engaged in transportation.

Since the percentage of farmers enumerated in the 1975 Census for Bukidnon as a whole was quite different from that for either Butong or Bagonta-as⁶ in particular, the difference in these barangays was quite likely occasioned by the advent of the sugar industry. This industry attracted technical and administrative personnel as well as transport workers, craftsmen, and factory hands to these localities. Presumably, to the extent that sugar cultivation tends to be mechanized, it has also displaced agricultural laborers, tenants, and small owners. The above data would certainly be consistent, at least, with such a hypothesis.

In Butong more than 20 percent of the tenants reported that the BUSCO or the sugar industry in general had adversely affected their livelihood. They reported that with the conversion to sugar they had lost their tenancies and now found it hard to obtain employment on a continuing basis. Another respondent (whose husband was not a farmer) mentioned that people near the BUSCO mill had lost their land to BUSCO through sale or other circumstances. In Bagonta-as, 13 percent of persons who identified themselves as tenants, said they no longer had permanent work because of lost tenancies. An additional 6 percent of all respondents (now engaged in other vocations but formerly farmers) said that they had lost their land to BUSCO (by sale, lost tenancy, etc.) and could therefore no longer employ themselves upon it.

It appears that relatively few persons actually obtained permanent employment from the sugar industry, even in Butong. Those that cited "work opportunity" may have meant that the BUSCO provides them with a future work possibility, if they should seek

6. The 1975 Census (Bukidnon: 72) enumerated 133,790 farmers in a gainfully employed population of 162,266 persons (82.5 percent).

employment in the mill or on a sugar farm. Relatively few cited "more income" as a benefit. Most who did were in the single barangay of Butong. A substantial percentage perceived no advantage at all to themselves from the sugar industry, and a substantial number did not know of advantages to themselves from the existence of the industry (51.3 percent combined).

All those who had identified themselves or their husbands as farmers in Butong and in Bagonta-as reported 1982 annual incomes of less than ₱5,000 a year. Since some of these persons had lost their land (through sale, termination of tenancy agreements, etc.), they would presumably have no food from their farms to fall back upon. Thus for them, in 1982, an annual income of less than ₱5,000 appears to have been below the line dividing absolute poverty from merely straitened circumstances.

Accordingly, the second hypothesis which states that the sugar industry would provide the common man with better employment opportunities, does not seem supported by the data, in the sense that these opportunities were superior to employment the population already enjoyed as small owners, tenants, or agricultural laborers on their own small farms or elsewhere. While the BPA claims that the sugar industry has provided up to 20,000 jobs, they have not presented any breakdown of this figure, and on the basis of the data presented above, one is inclined to doubt the claim. If indeed, during 1982 the industry did provide that many jobs, the vast majority of these jobs must have been very temporary, such as sharing in the harvesting of the sugar cane. This would provide wages only for several months at best. On the other hand, a small corn or rice farm provides much more employment opportunities for a farmer over the whole year.

These data do not support either hypothesis 2 or 3 (increased employment opportunities, rapid increase in real wages of labor, or any increase at all in real wages). They tend rather to lead towards rejection of these hypotheses.

Data were available from the micro-level study upon the subject of supply side hypothesis 4. This hypothesis stated that the households of laboring men would evaluate the period 1976-82, especially 1981-82, as economically better for them than the preceding period. These dates of course reflect the period before the initiation of the sugar industry in Bukidnon (pre-1976), and the period during which the sugar industry has been operative.

Readers should recall that these data were gathered when the peso rate was still fairly stable at ₱7.5 to the dollar. No perception of any special economic crisis was common.

A lack of enthusiasm for the post-1974 period emerges from the data. Benefits generated by the sugar industry have apparently been too tenuous for these randomly chosen households to judge that their present economic condition is better than it was before the advent of the sugar industry. "Trickle down" benefits from the sugar industry for the common man have apparently not been large.

DEMOGRAPHIC ANALYSIS

This analysis studies directly the relationships between the sugar industry, and the demographic processes of fertility, mortality, and migration. It does not directly study the interrelations of population size, distribution, and population composition. However, it does so indirectly since these structural aspects are the results of the particular fertility, migration, and mortality rates operating in a given location. While the relationship is a two-way process, it seems more logical to begin with the impact upon the Bukidnon population of the sugar industry. Fertility is the subject of greatest interest to the Philippine population program and is the first topic discussed here.

If the sugar industry has affected fertility in Bukidnon to an appreciable degree, one may hypothesize that it would do so principally by indirect influences, especially by (a) increasing opportunity costs of children in terms of competing desirable goods which can be purchased with increased income. For example, parents might desire better quality and more extensive education and/or better nutrition for already living children. Income therefore would be a critical factor, as would increased employment opportunities which would provide increase in income. The sugar industry might also affect fertility by (b) providing increased employment opportunities for women at a kilometer or more distance from their homes. This would also result in greater opportunity costs for women who might like to obtain employment in the sugar industry.

These possibilities were examined by means of two hypotheses:
(1) Because of opportunity costs occasioned by the establishment

of the sugar mill and sugar planting, the birth rate in the four barangays of study has declined over the past six years since initial operations of the mill and of the planters; and (2) Use of family planning has substantially increased beyond what might be expected as a result of the national population program alone.

Because the populations were small, data to test the fertility decline hypothesis were gathered in terms of crude birth rates and general fertility rates. Births for two years, 1 January 1981 to 31 December 1982, were compared with the base population for this period. The rates were:

Birth Rates

	<i>Butong</i>	<i>Bagonta-as</i>	<i>Dagumba-an</i>	<i>Macaopao</i>	<i>Overall</i>
Per 1000					<i>(Weighted)</i>
Persons	41.9	31.5	30.5	19.0	33.03
Per 1000					<i>(Unweighted)</i>
Women	89.0	63.0	66.5	37.3	64.0
All Ages					
Per 1000					<i>(Unweighted)</i>
Women	169.0	119.6	126.3	70.9	121.5
15-49					

In these data one should look less at absolute levels, since samples are small. (Stable birth rates may require a base population of approximately 5,000 households, whereas the present survey populations average about 285 households. Rather one should look at relative levels.

If the sugar industry had influenced fertility, one would expect the fertility of Butong and of Bagonta-as, where larger proportions of the population are involved in sugar industry operations, to be lower than in Dagumba-an, which would also be expected to have lower fertility than Macaopao where involvement in producing sugar is minimal. In fact, results came out in exactly the opposite fashion. Fertility rates were highest for Butong, next came Bagonta-as, then Dagumba-an, and Macaopao had lowest recorded fertility.

Accordingly, the second hypothesis, relating to family planning becomes more important. The data were:

Use of Family Planning (Percentage Values)

	<i>Butong</i>	<i>Bagonta-as</i>	<i>Dagumba-an</i>	<i>Macaopao</i>	<i>Unweighted All Barrio Means</i>
Users	48	40	32	12	33.0
Non-Users	42	42	46	52	45.5
Not Applicable ^a	10	18	22	36	21.5
Totals (Percents)	100	100	100	100	100.0
Households (n)	50	50	50	25	175

a. Over-age, sterile, husband away, unmarried.

As can be seen, these data exhibit an influence of the sugar industry upon fertility throughout. The largest number of users were found Butong, Bagonta-as came second, then Dagumba-an, and finally Macaopao.

The data suggest that the effect of the sugar industry upon fertility behavior is less due to influences of the sugar industry than to efforts of national family planning program outreach workers in contact with various barangay populations. The barangays that are closest to roads and more accessible, practised more and more varied family planning behavior. Those farther away practised less family planning, and the methods they practised were less varied. This result seems compatible with what is known of the national program. It tends to reach those who are more accessible first while striving to reach the more distant barrios through outreach workers. No one would suggest that the outreach workers, however zealous, will easily be able to reach all distant barangays to the same extent that very accessible localities are reached by family planning supplies and instruction, public and private in nature.

The clinic of the Bukidnon Sugar Milling Company, principally maintained for the good of its own employees, but also accessible to the general public, which has family planning instruction among its services, undoubtedly has had some impact upon family planning behavior in Butong and more generally in Quezon. These services are probably not very aggressive however, especially in outreach types of activity, since it is a private clinic.

Thus it is unlikely that the sugar industry through the BUSCO clinic has had much impact upon the general Bukidnon popula-

tion's fertility behavior, through its family planning services. On the other hand, as already seen, increased income because of the sugar industry has not reached a sufficiently substantial proportion of the lower economic class of Bukidnon, which constitutes the great majority of the population, to make the opportunity costs of more children large enough to notably affect Bukidnon birth rates. Given these two premises, the present writer concludes that the sugar industry of Bukidnon thus far has had little influence upon the Bukidnon population's fertility in general.

Mortality is another demographic process upon which the Bukidnon sugar industry may have had some effects. The data for convenience's sake have been divided into deaths of infants (less than one year of age), deaths of younger children (less than five years of age), and deaths of all the population. In each of these classes we considered dividing deaths and populations by sex in order to produce death rates by sex. The data however, upon examination, proved too few for such further division.

Infant mortality relates births during a particular time period to deaths of children before their first birthday during the same period. The data for this type rate were deaths between 1 January 1981 and 31 December 1982 as a ratio of births during the same period. The remaining death rates were central death rates. That is, deaths in each case were divided by appropriate populations at the center or middle of the period of observation, again, from 1 January 1981 to 31 December 1982. (The population of course is multiplied by two because the period is two years.)

	Butong	Bagonta-as	Dagumba-an	Macaopao
Infant Mortality	68.9	166.7	95.2	200.0
Death Rates of				
Children Under 1	45.5	136.4	76.9	250.0
Children Under 5	23.8	31.6	31.0	33.4
Of All Persons	5.7	10.3	8.5	11.1

Again, it is desirable to compare relative rather than absolute levels of mortality. (Stable death rates require larger populations than stable birth rates.)

Clearly, Butong enjoys lower mortality than do any of the other three barangays. The influence of the BUSCO clinic probably accounts for much of this difference which appears in the infant mortality, and in each of the three death rates. Higher educational attainment of parents and higher levels of income are probably

also involved.

Other than for Butong, the influence of the BUSCO clinic is not very evident. Nor is any advantage evident in the death rates accruing from increased income because of the sugar industry. In fact, the data for average income in each of the barrios (although subject to qualifications) suggests higher average income in Dagumba-an than in Bagonta-as. These average income data are:

<i>Butong</i>	<i>Bagonta-as</i>	<i>Dagumba-an</i>	<i>Macaopao</i>	<i>Unweighted Average</i>
₱7,500	₱5,100	₱5,800	₱4,450	₱5,712.50

Neither mortality rates, nor average incomes, suggest that outside Butong the sugar industry had much effect upon mortality. Rates for Bagonta-as, which is relatively not very far from BUSCO and its medical services, and which contributes a large share of its land to sugar production, do not seem to be as favorable as those found in Dagumba-an, and, for children under five and all-person categories, do not appear very different from those of Macaopao. Like fertility, one expects such an effect to be two-fold. The first would relate to medical care received from the Butong clinic. While this undoubtedly had an effect, presumably this effect would be very local and fairly well restricted to Quezon. Persons from other localities might well opt to go to other available clinics and hospitals which might be larger and more fully staffed. The second effect, operating through increased income, does not seem to have been large enough to have had much effect upon Bukidnon mortality. As already seen, the "trickle down" of profits from the sugar earnings of planters does not appear to have reached the laboring man in any substantial proportion. On the other hand, the dysfunctions that sugar cropping has introduced in terms of supplanting tenants and inducing small farmers to sell their land, may actually have tended to increase mortality rates in some localities and economic classes.

The data for the migration aspect of population change have already been partially considered previously in the macroeconomic section of this article. These data reveal heavier migration into Butong and Bagonta-as during and after 1974 (when the mill had been publicly discussed and definitively projected), namely, 72 percent and 42 percent, respectively.

However, neither the overall population of Butong nor that of

Bagonta-as (3,800 and 3,080 respectively) are persuasive that the sugar industry was more than one of several factors that increased migration to Bukidnon and within Bukidnon to the sugar areas. Probably the sugar industry added motivation in moderate but significant fashion for the migration into Bukidnon, and from non-sugar-producing areas of Bukidnon to sugar-producing areas, but it apparently made only limited contributions to overall Bukidnon migration.

The migration into Dagumba-an after 1973 was not much less than into Bagonta-as (an important sugar-producing barangay), and the migration even to Macaopao was substantial. Dagumba-an is not a large producer of sugar and Macaopao produces little or none. These facts lead on to qualify judgment about the migration to the sugar areas, although evidently these are substantial. It appears that the largest proportion of migration due to hopes of employment in the sugar industry was directed toward Quezon and Valencia, with relatively less to more southern municipalities. Of course, large seasonal migrations recurrently take place at harvest times, as harvesters move from place to place with the season. But this is a merely seasonal phenomenon. Further the experience of Negros and of Panay relating to the economic livelihood of such seasonal workers has not been encouraging.

SUMMARY

By way of conclusion we may summarize the advantages and problems of the Bukidnon sugar industry. The advantages accruing to Bukidnon Province and/or the entire nation from the sugar industry include the following:

1. A healthy, stable, and thriving industry has been set up in Bukidnon which gives the province an additional cash agricultural crop beyond rice and corn staples, thus allowing for a stronger agricultural economy because more diversified;
2. The reduction of the land cropped to corn and upland rice may better the competitive position of the small-farm corn and rice producer and thus bring him better prices for his cereal crops in the market;
3. The mill itself has set an admirable record for efficiency, topping the list for four consecutive years from 1979, until it upgraded its capacity from 4,000 metric tons of cane per day to 6,000;

4. Planters have made substantial profits, 1976-82. Thus they have been able to invest more money based on their sugar production in their farms, and on other investments.
 5. A functioning clinic has been set up in BUSCO that not only treats BUSCO workers but provides emergency services to the general public when necessary.
 6. New employment opportunities have been created on the sugar plantations and in the mill because of this new industry, and in addition free housing has been made available by the BUSCO to employees;
 7. It has made possible the development of new by-product industries based upon the sugar industry such as livestock feed, boiler fuel, building board, polishes, paper coatings, cosmetics, the manufacture of sodium glutamate, the production of sugar esters, the making of high quality rum, the manufacture of alcohol and of "alcogas," the production of cane wax, etc.;
 8. Substantial income, real property, and production taxes have been paid to the government by planters and mill as opposed to the small payments previously made from the same land by corn and upland rice cropping;
 9. Substantial amounts of potential foreign exchange have been earned by Bukidnon sugar through NASUTRA from 1977 through 1982, and ongoing.
 10. Credit advances have been made to planters by the mill to enable purchase or preparation of good cuttings, of fertilizers, of pesticides, etc.
- However there have also been disadvantages. Among these are:
1. The precarious nature of sugar prices on the free world market, especially in 1984 when the UNCTAD agreement of 1969 has thus far not been renewed. A sudden plunge of sugar prices in addition to a low U.S. quota total for Philippine sugar, or a low quota preferential price in the U.S. market, could prove seriously damaging to planters who have invested large resources in their crops, and to the mill which might find its expenses exceeding its revenues, even by a considerable amount — analogous to what has happened to mines in the copper industry;
 2. The contracts that planters sign are for long periods, considering the volatile nature of sugar prices. In addition, they

- are renewable for a second period of the same length, at the option of the mill. On the face of it, this could mean planters would be legally bound for years to produce sugar at a loss—a situation that could wreak havoc in the Bukidnon economy;
3. The production of rice and corn of Bukidnon Province has declined, thus contributing to the failure of the nation to maintain self-sufficiency at the present time and requiring the expensive importation of foreign rice;
 4. The increase in sugar cropping hectareage has meant that many small-scale farmers have sold their lands to sugar plantations and/or have lost tenancy rights on lands converted from corn or rice. Thus the pool of surplus agricultural laborers, already a surplus, has been further expanded. These laborers are generally highly skilled in rice and corn production techniques, but of low skills in techniques of sugar production;
 5. As many as 7 to 10 percent of former small-farm owners have by sale, tenancy loss, or otherwise, been reduced to the status of underemployed farm laborers;
 6. Skilled cutters (*tapaseros*) migrating from Panay and Negros for harvesting take away many employment opportunities from Bukidnon labor;
 7. The capital intensive mode of production of most planters who substitute machines for manpower greatly constrains the employment potentials of the sugar industry, despite the large reservoir of underemployed and unemployed labor in Bukidnon.
 8. Despite the profitability of sugar farms over the period, 1976-82, some planters did not pay their labor the minimum wage, and in fact, paid considerably less;
 9. Minority group households because of poor education, very limited knowledge of the law, and lack of political power, have generally been unable to cope with the legalities involved in maintaining their ancestral lands, and for the most part have been displaced to the marginal lands adjacent to and within the mountainous areas bordering the Bukidnon plateaus.

Assuming that the goals of the state are the common good of all the citizens and maintenance of order and social tranquility, a sugar industry does not appear to have been a very appropriate

choice. While it is understandable that such less fortunate choices are made at the beginning of a new development thrust such as agri-business, this experience has several lessons which by hindsight may profitably be kept in mind for the next such investment choice.

Several factors about a potential sugar industry in Bukidnon should have given pause. A brief cataloguing of these may prove helpful for better discrimination of possible projects when the next opportunity arises. The world market price of sugar makes it a somewhat risky investment of national funds. The transfer of land from corn and upland rice has diminished the supply of corn and rice in the domestic market at a time when the nation had just about achieved self sufficiency in these basic food crops.

However, these disadvantages might have been more than compensated for if the government had seen to it that Bukidnon sugar be labor intensive in its production undertakings. However, the government did not give such directives, and the larger Bukidnon planters have mainly utilized capital intensive techniques. As a result, the small owners who sold out and the tenants who lost tenancies have swelled rather than diminished the already large pool of unemployed or underemployed rural workers in Bukidnon. Without land of their own to fall back upon, these workers are finding it difficult to provide proper nourishment for their wives and children.