

PN-ANN-218
ISN: 29901

9311191

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CHARACTERISTICS OF MANUFACTURING ENTERPRISES
BY LOCALITY SIZE IN FOUR REGIONS OF HONDURAS:
IMPLICATIONS FOR RURAL DEVELOPMENT

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Presented at Annual Meeting
of the Midwest Association
for Latin American Studies
October 11-13, 1979

This paper has been prepared as part of Michigan State University's Off-Farm Employment Project, which is financed by the Office of Rural Development and Development Administration, Development Support Bureau, U.S. Agency for International Development (AID/ta-CA-2). Funding for the survey and analysis were provided by this project as well as USAID/Honduras.

I. INTRODUCTION

Honduras, as a whole, has a land area of 112,088 square kilometers and a population of 2,752,541 (1974 census) for a population density of 24.6 persons per square kilometer. Population is estimated to be increasing at approximately 3.6 percent a year with the rural increase being 2.5 percent, and the urban increase about 5.5 percent. GNP per capita is approximately \$340. Eighty percent of the population have an average income per capita of less than \$80. Most of the poor are located in the rural areas which have 70 percent of the population. Seasonal unemployment in the rural areas is estimated as high as 70 percent (Mejia, 1978).

Given the existence of poverty, high rates of rural unemployment, and the high rates of urban growth, the government of Honduras began considering alternative employment opportunities in the rural areas. One such alternative is rural industry, especially small-scale firms located in rural areas which produce inputs and simple consumer goods for the local population. Unfortunately, little was known about the characteristics of rural industries or their potential for increasing employment and output.

This paper discusses the preliminary results of a survey of rural industries carried out in four priority regions¹ in January and February, 1979, by the Honduran Center for Industrial Development, the United States Agency for International Development, and Michigan State University. The survey results were used to design a program of assistance to small industries in the regions.

¹The four regions selected by the government as priority regions were: the Department of Ocotepeque in the west, bordering on El Salvador and Guatemala; the Marcala-Guascoran region in the southwest, bordering on El Salvador and located within the Departments of Valle and LaPaz; the Jamistram Valley in the southeast, a rich agricultural region; and the Guaype Valley in the east central, a rich agricultural region which has large forest reserves.

Within each of the four regions, the localities were divided into five strata according to population size, and random sampling was done from each strata (see Table 1). When fieldwork in the first region demonstrated that very few industries existed in the stratum with 1-49 inhabitants, this stratum was dropped from further study.

The enumerators went street by street in the communities selected, listing and interviewing all manufacturing and repair enterprises. It should be pointed out that services, other than repair, and trading enterprises were not interviewed. The questionnaires included a census form concentrating on employment and physical plant characteristics; a stock form listing machines and tools, raw materials, and finished items; and a socioeconomic questionnaire which was administered to every third industry of a kind. The findings reported in this paper utilize data from the census questionnaire only.

This paper discusses the magnitude of firms, the composition of industries, labor intensity, and ownership by sex to test the hypothesis that firm characteristics change as community size changes. The final section summarizes the major findings and discusses some policy implications of those findings.

II. PRINCIPAL CHARACTERISTICS OF INDUSTRIES

A. Magnitude

On the basis of the survey, we estimate² there are 3,820 firms employing 8,657 people in localities with more than 50 inhabitants.³ When these findings

²Estimations were made by weighting survey results by the inverse of the sample percentage for each stratum in each region.

³Although industries were found in all strata, fieldwork in the region of Ocotepaque showed that very few industries existed in localities with less than 50 inhabitants. This stratum was dropped from further study in the other regions. For this reason, the figures presented probably underrepresent actual numbers of firms and employment. Based on the data collected in the Ocotepaque region, there are approximately 100 firms in the smallest localities of that region. Over the four regions, this would indicate an undercounting of 500-600 firms and 600-750 workers.

TABLE 1. COMMUNITIES AND POPULATION BY LOCALITY SIZE

Locality Size	Number of Localities	Population	% of Total Population
Stratum 1 1-49 inhabitants	1,805	35,361	14.09
Stratum 2 50-499 inhabitants	930	131,155	52.24
Stratum 3 500-1999 inhabitants	48	40,057	15.96
Stratum 4 2000-4999 inhabitants	5	14,427	5.75
Stratum 5 5000 + inhabitants	3	30,034	11.96
Total	2,791	251,034	

are compared with official government statistics, there is some indication of undercounting of industrial establishments (see Table 2). Due to the undercounting, the contribution of rural industries to Gross National Product and employment is probably larger than presently documented.

B. Composition

The survey found 59 types of industries and repair services in the regions surveyed. The 59 industries were grouped into categories following the International Standard Industrial Classification. As shown in Table 3, the most important broad category of industries is textiles and apparel (43.8 percent of total firms), followed in order of importance by the food, beverage, and tobacco industries (22.4 percent); nonmetallic mineral production (14.1 percent); wood and wood products (11.5 percent); and repair services (3.2 percent). In terms of individual industries, the garment industry (tailors and seamstresses) accounts for 36.3 percent of total firms; bakers, 13.9 percent; carpenters and cabinetmakers,⁴ 10.2 percent; and potters, 8.9 percent.

C. Firm Size

Categories of firm size are based on the following definitions from the Honduran government:

Artisan Industry: 1-5 workers and no machinery.

Small Industry: 6-19 workers or fixed assets less than \$25,000.

Medium Industry: 20-100 workers or fixed assets between \$25,000 and \$375,000.

Large Industry: More than 100 workers or fixed assets greater than \$375,000.⁵

⁴It should be pointed out that carpenters produce unfinished wood products and furniture in a workshop while a cabinetmaker produces the same types of products, but with finishing work. Carpenters who work only in the construction industry (i.e., do not have a workshop) are not included.

⁵If the firm fits one of the two conditions, it is classified into the higher of the two categories.

TABLE 2. NUMBER OF INDUSTRIAL ESTABLISHMENTS AND EMPLOYMENT BY INDUSTRY SIZE IN FOUR REGIONS

	Census		Survey ³	
	# of Firms	Employment	# of Firms	Employment
Artisan Industry	2,709 ¹	4,078	822	1,364
Small Industry	39 ²	*	2,850	6,162
Medium Industry			23	548
Large Industry			3	583
Repair Services			(122)	
TOTAL	2,748	*	3,820**	8,567**

* Data not available.

** These totals underestimate the actual number of firms and employment, given that communities of less than 50 people are not included. Based on information from the region of Ocotepeque, there are approximately 100 firms in that stratum. This would indicate an under counting of 500-600 firms and 600-750 workers.

¹ Industria Artesanal: Censo de Poblacion y Vivienda, 1974.

² Censo Industrial, 1974.

³ Honduras Rural Industry Survey, 1970

TABLE 3. NUMBER OF FIRMS BY BROAD INDUSTRIAL CATEGORY AND BY SPECIFIC INDUSTRY TYPE¹

Industrial Classification	Number of Firms ²	% of Total Firms ²
31 Food, Beverages, and Tobacco	<u>857</u>	<u>22.4</u>
3111 Packing Plant	1	
3111 Sausage Making	2	
3112 Milk Processing	37	
3113 Food Preservation	9	
3117 Tortilla Maker	69	
3117 Corn Bread	59	
3117 Baker	532	
3119 Candy Makers	38	
3121 Salt	2	
3131 Alcohol Distillation	1	
3134 Water Purification	5	
3134 Popsicles, etc.	3	
3140 Cigar Making	6	
3118 Sugar Cane Mill	92	
32 Textiles, Apparel, Leather	<u>1,673</u>	<u>43.8</u>
3213 Knitting and Crocheting	6	
3214 Straw Mats	34	
3215 Articles of Plastic Twine	21	
3215 Macramé	1	
3215 Rope and Rope Products	103	
3220 Tailor	262	
3220 Seamstress	1,126	
3231 Tanning	7	
3233 Animal Pack Saddles	1	
3233 Leather Worker	27	
3240 Shoemaker	84	
33 Wood and Wood Products	<u>440</u>	<u>11.5</u>
3311 Sawmill	17	
3312 Basket Weaver	23	
3319 Woodcarver	1	
3320 Carpenter	382	
3320 Cabinet Maker	8	
3320 Upholstery	7	
3320 Mattress Maker	1	

TABLE 3 Cont'd

Industrial Classification	Number of Firms ²	% of Total Firms ²
34 Paper and Paper Products	<u>6</u>	
3412 Paper Bags	3	
3420 Printer	2	
35 Manufacture of Chemicals	<u>2</u>	
3529 Fireworks	2	
36 Nonmetallic Mineral Products	<u>537</u>	<u>14.1</u>
3610 Potter	339	
3691 Clay Brick and Tile	115	
3691 Adobe Blocks	49	
3692 Lime Kiln	14	
3699 Tombstone Carver	1	
3699 Cement Tile	13	
3699 Cement Blocks	2	
3699 Cement Blocks and Culverts	2	
3699 Stone Mason	1	
38 Fabricated Metal, Machinery and Equipment	<u>103</u>	<u>2.7</u>
3811 Blacksmith	84	
3812 Ironmonger	6	
3819 Tinsmith	8	
3819 Welder	2	
3821 Metal Industry	2	
3829 Firearms Repair	1	
39 Other Manufacturing Industries	<u>81</u>	<u>2.1</u>
3909 Broom Maker	10	
3909 Flower Maker	71	
94 Recreational and Cultural Services	<u>2</u>	<u>.05</u>
9415 Sculptor	2	
95 Personal and Household Services	<u>120</u>	<u>3.2</u>
9512 Radio Repair	36	
9512 Electronics Workshop	6	
9512 Refrigeration Repair	2	
9513 Motor and Auto Repair	56	
9514 Watch Repair/Jewelry Maker	17	
9519 Bicycle Repair	3	
TOTAL	3,820 ²	

¹ Honduras Rural Industry Survey, 1979.

² Totals are not exact due to rounding errors in the extrapolation.

The results of the survey show the average firm to be quite small, as 77 percent of firms are classified as small and 22 percent are classified as artisan. Medium and large-scale firms are less than 1 percent of the total firms.

This industrial size classification, using a definition which combines employment and assets, obscures a very important feature of firm size. In absolute numbers, 2,251 firms, or 58.8 percent of total firms, in the four regions are one-person firms. There are 94.3 percent of total firms that have five or less workers.

III. FIRM CHARACTERISTICS BY COMMUNITY SIZE

Although not directly addressing the hypothesis, some previous studies of small-scale industry have documented changes in firm characteristics as locality size changes.

In Haiti, larger localities have a larger variety of industries which have a higher average number of workers and also a higher capital intensity than firms in smaller localities (Haggblade et al., 1979). A survey of small industries in Jamaica found that average numbers of workers increased as community size increased (Davies et al., 1979). In Sierra Leone the composition of industries varies by locality size and the mean annual value added increased with locality size (Liedholm and Chuta, 1976). The average number of workers per firm also increased in the larger localities (Chuta and Liedholm, 1975).

All of the findings cited above concentrate on small-scale industries. In Ghana, Steel (1977) found that the different scales of industry, defined by the size and composition of the labor force, varied in importance by locality size. In Honduras, industry of all sizes was surveyed. Thus, we expect that changes in magnitude, composition of industry, firm size, and labor

intensity may be more pronounced than those documented in research which concentrates only on small-scale industry.

A. Number of Firms by Locality Size

Steel (1977) suggests that one test of the changing magnitude of firms by locality size is to compare the number of firms to the total corresponding population. Table 4 shows that the number of firms is a small percent of total population, ranging from 1.05 percent to 2.5 percent. This figure tends to increase slightly as community size increases, although it does fluctuate slightly.

In general, the percent of total firms in each stratum of a region corresponds closely with the percent of regional population in the stratum. Therefore, the number of enterprises declines and then rises as community size increases because total population in each stratum declines, and then increases in the largest stratum.

This would seem to indicate that numbers of industries are more closely associated with absolute numbers of population than with community size. It may also be possible that our range of community sizes, 50-11,000 inhabitants, was simply too small to demonstrate the variation which has been found in other countries where the localities surveyed had a much larger size variation.

B. Types of Industries

Having found that the number of firms seems to be more closely related to the population than to community size, we now turn to a discussion of the variation in types of industries by locality size.

As seen from Table 5, the major industrial categories do not vary substantially between the different community strata. However, a few exceptions should be discussed. Food industries, for example, account for 23-25 percent of all firms in each stratum, except for the largest localities in which they

TABLE 4. FIRMS AS A PERCENTAGE OF STRATUM POPULATION BY REGION¹

Locality Size	Firms as a % of Stratum Population				Stratum Mean
	Ocotepeque	Marcala- Guascoran	Jamistran	Guayape	
Stratum 2 50-499	1.9	1.4	1.05	1.6	1.5
Stratum 3 500-1999	2.5	2.4	2.3	1.9	2.2
Stratum 4 2000-4999	1.9	2.5		2.4	2.3
Stratum 5 5000+			2.1	2.1	2.1
Regional Mean	1.7	1.4	1.3	1.6	1.5

¹Honduras Rural Industry Survey, 1979.

TABLE 5. INDUSTRIAL CATEGORIES BY COMMUNITY SIZE AS A PERCENTAGE OF REGIONAL TOTALS¹

Industrial Category	% of Firms in Region			
	Stratum 2 50-499	Stratum 3 500-1999	Stratum 4 2000-4999	Stratum 5 5000+
31 Food	23.6	24.4	26.7	13.9
32 Textiles and Apparel	42.5	43.1	44.7	48.2
33 Wood	11.5	11.4	10.3	12.2
34 Paper				1.0
35 Chemicals		.2		
36 Mineral Products	19.8	10.3	4.0	6.4
38 Metal Products	1.8	3.1	5.2	3.8
39 Other Mfg.	.6	4.8	4.0	2.4
94 Cultural		.2		.2
95 Repair Services	.25	2.4	5.5	12.0
Total	100.0	100.0	100.0	100.0

¹Honduras Rural Industry Survey, 1979.

account for only 13.9 percent. It is possible that a few larger firms in this stratum may have displaced many of the smaller firms such as bakeries.

The importance of repair services increases as community size increases. This is not surprising, given that car and electrical equipment repair firms predominate and the demand for those activities is more highly concentrated in the larger towns.

Within the mineral products category, the importance of potters increases as community size decreases, while the importance of clay tilemakers increases with community size. These changes might also be traced to demand factors. In the case of clay tiles, the high growth rates of the towns necessitate more construction materials than the lower growth rates of the rural areas. The demand for pottery is reversed; rural areas have a higher demand than the larger communities where more durable, metallic substitutes are available.

Shoemakers increase in importance in urban areas, while in rural areas, demand is low because people go barefoot, make their own sandals from tires, or purchase molded plastic shoes and sandals. Iron mongers who make iron grillwork and balcony irons exist only in the large towns where the use of glass windows necessitates protection. Rural houses have few windows and these are shuttered from the inside at night with wooden shutters.

There is also some variation of industrial composition by region, often due to the availability of raw materials in the region. In the Marcala-Guascoran region there are high numbers of ropemakers and potters, both of which require raw materials native to the region. The garment industry is more important in Ocotepaque than in any other region (42.7 percent of regional firms), perhaps due to the availability of cheap textiles from neighboring Guatemala and El Salvador. Overall, the region of Marcala-Guascoran varies most from other

C. Firm Size

From Table 6 one can see that artisan and small firms are numerically more important in the smallest communities, although once again their numerical importance varies directly with absolute population. Surprisingly, the two smallest community strata also account for 10 of the 23 medium-sized firms. A closer look at these particular firms reveal seven of them to be sawmills which, although located in rural areas for their raw materials, employ substantial amounts of labor and capital. Of the remaining three, two may be food processing cooperatives and one is engaged in metalworking. It is also interesting to note that only one medium-sized industry is located in the five towns in the stratum of 2,000-4,999, the other 11 medium-sized industries are found in the three towns above 5,000 people.

The regional figures show medium-sized industries to be distributed somewhat unevenly among the four regions, while large-scale industries exist only in the Jamistran region and are located in Danli, municipal seat of the region and the largest town in the survey. The region of Olancho has few medium-sized firms and no large firms even though it has a population of 19,000 in its larger towns. The relative importance of artisan and small industry does not seem to vary significantly by region. This would be expected if they produce primarily simple consumer goods and processed food for local demand.

Employment and assets, the two variables defining firm size, will now be discussed individually because changes in these two variables would explain changes in firm size.

D. Employment

A total of 8,657 persons are employed in 3,820 firms in the four regions, with an average of 2.17 persons per firm (including proprietors).⁶ There

⁶It should be remembered that the totals and means are calculated with total firms, including three firms with 100 or more employees.

TABLE 6. NUMBER OF FIRMS IN EACH COMMUNITY STRATUM BY FIRM SIZE¹

Industry Size	Locality Size				Total	% of Firms
	Stratum 2 50-499	Stratum 3 500-1999	Stratum 4 2000-5000	Stratum 5 5000+		
Artisan	441	231	84	92	850	22.2
Small	1,540	644	244	516	2,944	77.1
Medium	5	5	1	11	23	.6
Large				3	3	.1
Total	1,987	881	329	624	3,820	
% of Firms	52.0	23.1	8.6	16.3		

¹Honduras Rural Industry Survey, 1979.

is a clear trend for average employment per firm to increase as community size increases, although this trend moves downward slightly in localities with 500-1,999 inhabitants.

The dramatic increase in average employment in the food industries as locality size increases is attributed mainly to several large- and medium-scale meat processing firms and a tobacco firm located in the larger towns. The wood industry and repair services also demonstrate fairly large increases in average employment as locality size increases.

Although the general trend within an industry is for average employment per firm to increase as community size increases, there are exceptions. Once again, potters show a decline as community size increases, most likely for the reasons discussed earlier. The category of other manufacturers, which is composed of makers of brooms and flowers made from dried, natural materials, also shows a decline in average employment as community size increases. Both of these industries use agricultural and forestal raw materials which are not readily available in larger towns.

E. Assets

Fixed capital, as used in the definition of industry size, includes buildings (when not part of the home), tools, and machines, but excludes land values. Once again, the size classification obscures the distribution of fixed assets among firms. A total of 54.71 percent of all firms have fixed assets of \$100 or less. Over half of such firms were located in the smallest community stratum. Nearly 81 percent of all firms have fixed assets of less than \$250 and 92 percent of all firms have fixed assets of less than \$500.

Some care must be taken in interpreting these figures since, as mentioned above, buildings were not assigned a value if the shop was physically located within the family living quarters. A very large percentage, 76 percent of

all industries, were within the home. If a value was assigned to the space occupied by the shop, the value of fixed assets would certainly rise. Of the shops located within the home, 54 percent are in communities of 50-499 inhabitants.⁷

Of the firms with \$100 or less in fixed assets, over half are located in communities of 50-199 inhabitants. Of all firms in this stratum, 62.36 percent have fixed assets of under \$100. There is a trend for fixed assets to increase as community size increases.

Likewise, in all industrial categories fixed assets per firm increase as community size increases. Firms in the category of other manufacturers average the smallest fixed assets (approximately \$10) and also have the smallest spread of fixed assets between strata--from \$5.75 to \$16. Tilemakers have the highest average fixed assets at \$4,100 and, at the same time, demonstrate the largest spread of average fixed assets, ranging from \$27 in the smallest localities to \$18,500 in the largest. Mechanics are second in average value of fixed assets with \$2,750.

F. Capital-Labor Ratio

For purposes of employment generation, it is instructive to look at the ratio of fixed capital to labor to see which industries are using relatively less of the scarce factor of capital and relatively more of the factor of labor. It is generally expected that larger firms are more capital intensive and smaller firms are more labor intensive.

The following chart, which lists average fixed capital per worker, shows that Honduran firms deviate somewhat from this pattern as medium-scale firms are more capital intensive than large-scale firms:

⁷The longitudinal follow-up study hopes to assign a value to the space within the home used by the industry.

Artisan Industry:	\$64 per worker
Small Industry:	\$342 per worker
Medium Industry:	\$104,233 per worker
Large Industry:	\$30,334 per worker

Besides variation by firm size, the capital labor ratio also varies by industry. Mechanics average \$693 of fixed capital per worker, while potters average less than \$10 per worker. The garment industry (the largest industry) averages \$160 of fixed capital per worker, approximately the price of a sewing machine.

Within an industry the amount of fixed capital per worker increases as locality size increases, indicating that a range of production techniques are being employed. This range of ratios and production techniques indicates that it might be possible to increase employment by using specific techniques of production. Further study could define those techniques which produce quality output while employing relatively more labor and less capital.

G. Ownership by Sex

Country surveys have documented varying levels of importance of women in industrial ownership and employment. In Ghana, women are 54 percent of the industrial work force (Steel, 1977). Liedholm and Chuta (1976) found that employment of women in small-scale industries was important only in the gara-dyeing industry. Women in selected areas of Bangladesh are only .1 percent of proprietors, but 34 percent of the work force, in rural industries (Bangladesh Institute, 1979). In Haitian small industry women are 20 percent of the entrepreneurs and 16 percent of the labor force (Haggblade et al., 1979). The Honduras data show a much larger role for women, who own 60.7 percent of all firms and are nearly 50 percent of workers. A similar role is documented for women in other Central American countries.

According to the Nicaraguan Office of Census (1974), 22 percent of all employers in industry and manufacturing are women. Women are 46 percent of employers in hotels, restaurants, and commerce (Diebold de Cruz et al., 1975). The same report goes on to say "...most rural women engage in some kind of small business activity to supplement the family income..." (Diebold de Cruz et al., 1975).

In Guatemala, in rural enterprises women are 8 percent of the work force for wood products; 50 percent for textiles; 17 percent for leather; 47 percent for food processing and baking; and 65 percent for commercial services (Daines, 1978).

Of the firms owned by women, 58 percent are located in localities with 50-499 inhabitants. In that stratum women own twice as many firms as men. The number and percent of firms owned by women declines as community strata increases. In the largest communities, men own 56 percent of all firms. Across strata, female ownership is concentrated in bakeries, the garment industry, and pottery. Men own all carpentry firms and nearly all tilemaking firms and mechanic shops.

Although men and women account for approximately 50 percent each of total employment, there is a definite sex-typing by industry. This pattern is so strong that no pattern or trend by community size can be discerned. The food, textiles and apparel, and other manufacturing categories are heavily female. The mineral products category is almost evenly divided between male and female employment. However, within this industrial category, the pottery industry is almost exclusively female and the clay tile industry is nearly all male. Within the textiles and apparel category, which is heavily female, the shoemakers are almost all male. Wood industries, metal products, and repairs services are

nearly exclusively male. Firms with female owners tend to employ almost exclusively female workers and male owners have nearly all male workers.

IV. SUMMARY AND IMPLICATIONS OF MAJOR FINDINGS

Survey results gave a total of 3,820 firms in the four regions employing 8,657 workers.⁷ This indicates an undercounting by government statistics of small-scale industries in rural communities, so that industrial employment and output are probably higher than current statistics indicate.

Of the 3,820 firms, 22 percent are classified as artisan industries and 77 percent as small-scale industries. More specifically, 94 percent of firms employ five or fewer people and 59 percent are one-person firms. Average fixed assets per firm are also low with 81 percent of all firms reporting fixed assets of less than \$250. Composition of industries varies by community size and region. The number of firms seems more closely related to absolute population than to locality size. Average employment, average value of fixed assets, and capital intensity increase as locality size increases. Family living quarters also double as the workshop for 76 percent of the firms.

Given the undercounting of small firms in rural areas, government policy has not taken advantage of the potential of these firms to create employment with low capital investment.

The number of firms is a fairly consistent percentage of stratum population which may indicate that these firms respond directly to local demand. Programs to promote the expansion of local industry, besides removing supply or financial constraints, may also need to include programs for increasing

⁷ It should be remembered that these figures themselves are an undercounting as communities of less than 50 people were not included in the survey.

effective demand of rural consumers through increased income from agricultural or other employment.

Perhaps the most interesting results of the survey are the findings concerning ownership and employment by sex. The number of firms owned by females decreases as community size increases. A total of 60.7 percent of the firms have female owners. The female owners are concentrated in bakeries, the garment industry, and pottery, and employ almost exclusively female workers. Owners of carpenter shops, mechanic shops, and tilemaking firms are almost exclusively male and employ predominately male workers. Female firms hold 9 percent of the fixed assets and employ 42 percent of all workers.

Government industrial programs must consider their impact on women engaged in small industry. Boserup (1970) points out that programs which encourage large industries gradually drive the home industries out of business and women from their jobs because (1) they cannot compete with factory production, or (2) they are displaced by men as industries become more mechanized.

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