

INCOME DIMENSIONS OF CARIBBEAN DEVELOPMENT PROBLEMS: THE LAS CUEVAS REGION OF THE DOMINICAN REPUBLIC

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Introduction

The Dominican Republic is characterized by low absolute levels of personal income and a high degree of income inequality. A recent World Bank (1980) study found slightly over 50 percent of the population with incomes below the poverty level. The lack of adequate income is more pronounced in rural areas with large concentrations of absolute poverty and a general lack of employment security (Quezada, 1981). In the Dominican Republic in 1976-77, rural residents, who comprised 58 percent of the population, received less than 43 percent of the total income in the country (Banco Central, 1981). Low effective demand in internal markets and low levels of social and economic well-being for a majority of residents are primary limitations on national and regional development in the country (Secretaria de Estado de Agricultura, 1976). Unfortunately, a lack of adequate, timely data often prevents a full understanding of income problems in the Dominican Republic and elsewhere in the Caribbean, particularly in rural areas.

This paper reports the results of a study of household income in the Las Cuevas region of the Dominican Republic. The study area is rural in character, relatively isolated from major urban areas, and dependent to a large extent on agricultural activities for income. As such, the area is typical of many other regions in the Dominican Republic and other Caribbean countries. Thus, reported results should provide insights which extend beyond the particular region under study.

The Las Cuevas Region

The Las Cuevas region covers approximately 600 square kilometers and is located in the southwestern part of the Dominican Republic. The population in 1981 was 31,148 people, an increase from 19,360 in 1960 and 26,081 in 1970. Population density in the region in 1981 was 52 persons per square kilometer; there was an average of six persons per household, and 57 percent of the population was less than 18 years old. The population of the region was 79 percent rural and 29 percent urban, with the urban population concentrated in two small villages (Padre Las Casas and Guayabal) and with the rural population living in small settlements scattered throughout the region (Oficina Nacional de la Republica Dominicana, 1982).

The Las Cuevas region is primarily an agricultural area and is characterized by low levels of social and economic well-being and associated problems of nutrition, health care, illiteracy and high birth and death rates (Lois, 1982). Thus, the Las Cuevas region faces the usual problems of rural areas in developing countries. Further, the region has experienced a severe degradation of its natural resource base. Declining yields in slash-and-burn agriculture, increases in the amount of land devoted to extensive grazing, continued deforestation and soil erosion provide visible symptoms of the natural resource problems. The region has one of the more severe erosion problems in the nation (Hartshorn *et al.*, 1981). These factors

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combined make personal income in the region a matter of primary concern to policy-makers interested in regional development.

Data Sources and Income Estimation Procedures

Income estimates reported in this paper are based on primary data taken from a survey of households in the Las Cuevas region. The population of interest was the 5,609 households in the region from the most recent census. Sample size was calculated following Mendenhall, Ott and Scheaffer (1971) using an estimate of variance from data on rural household income in the Dominican Republic. The sample included 287 households selected systematically from a randomly selected starting point in the various communities of the Las Cuevas region. A personal interview for the agricultural year May 1981-April 1982 was conducted with the head of each sample household during the period June 23-July 30, 1982 by Dominican Students attending the University of Florida under a research and training program of the University's Center for Latin American Studies.

More than 1,000 data items were collected from each household unit including such items as location, characteristics of household members, living conditions, food consumption and other expenditures, agricultural production and income. Household income was then estimated based on three major income sources: (1) farm income, including the net contribution to total income of cash sales, production used for self-consumption and production used to purchase inputs; (2) off-farm income, which includes all nonfarm earnings of the household head; and (3) income earned by household members other than the head, including income transferred by household members who no longer reside within the household unit. Following sections present the major characteristics of the sample households and the results of the income estimation.

Income Estimation Results

Sample Household Characteristics: General characteristics of sample households are presented in Table 1 along with mean values for selected household characteristics. The 287 households sampled represent a total population of 2,049 related persons with 78 percent of the total still living in the same household

TABLE 1

Distribution of Las Cuevas Sample Households, 1981-82.

Variable	Frequency	Percentage	Mean
Total Households	287	100.0	
Location			
Urban	92	32.1	
Rural	195	67.9	
Sex of Head			
Male	268	93.4	
Female	19	6.6	
Education of Head			2
0-6 years	265	92.3	
7-12 years	18	6.3	
13 or more	4	1.4	
Household size			6
1 person	8	2.8	
2 persons	29	10.1	
3 persons	32	11.1	
4 persons	31	10.8	
5 persons	52	18.1	
6 persons	37	12.9	

TABLE 1 (continued)

Distribution of Las Cuevas Sample Households, 1981-82.

Variable	Frequency	Percentage	Mean
Household size (continued)			
7 persons	31	10.8	
8 persons	29	10.1	
9 persons	16	5.6	
10 or more	22	7.7	
Age of Head			44
Occupation of Head			
Hired	40	13.9	
Farmer	172	59.9	
Trader	9	3.1	
Government Employee	22	7.7	
Charcoal Master	10	3.5	
Other	34		
Land Holder			
Yes	192	66.9	
No	95	33.1	
Population Related to Household			
Living with Head	1600	78.1	
Living Elsewhere	449	21.9	

as the head. The average household has six members. Sixty-eight percent of the households are rural with the remaining households located in urban areas.

The Las Cuevas population is generally young with low levels of education. Most household heads are male with an average age of 44 years and an average of two years of formal education. Ninety-two percent of the household heads have six or fewer years of school while only two percent exceed the high school level of education.

Sample household characteristics in Table 1 also reflect the importance of agriculture to the economic base of the Las Cuevas region. Almost sixty percent of household heads are farmers, hired farmers or farmers who also have other occupations. An additional 14 percent are hired agricultural workers. Only 33 percent of household heads are not involved in some way with the operation of a farm.

The importance of agriculture as an income source makes the distribution of land among households in the region an important determinant of the level of household income and the distribution of income among households. Table 2 reports the frequency of land by size of land holdings among the farmer subgroup of the Las Cuevas sample. As is evident from these data, land control is highly concentrated with six percent of the households controlling almost 62 percent of the land. Over 56 percent of sample households fall in the two smallest categories of land holdings.

In short, the Las Cuevas sample household characteristics depict a region highly dependent on agriculture with few non-farm employment alternatives. Household heads tend to have little formal education and operate small farms or work as hired farmworkers. This situation is typical of many developing regions and would lead one to expect relatively low levels of income and a high degree of inequality in the distribution of income.

Income Levels: As noted, total income is estimated as the sum of farm income, nonfarm income and earnings by household members other than the household head. The latter two categories are taken directly from questions on the survey. Farm income is calculated as the sum of cash sales and imputed market values of goods consumed at home or traded for inputs. Production expenditures were then subtracted to obtain net farm income. Farm income was estimated in two ways with different assumptions about the value of family labor. In the first approach, family labor was considered a cost of agricultural

TABLE 2

Land Holdings and Incomes of Single Households
by Size of Land Holding

Size of Land Holding in Tareas*	Number of Households	Percentage of Households	Total Tareas By Class	Percentage of Land By Class	Mean Total Income	Mean Farm Income	Off-Farm Income Percent
Less than 10	24	12.5	195	0.6	1142	181	84.1
11-50	84	43.8	2,387	7.4	1165	611	47.5
51-100	44	22.9	3,468	10.7	1266	818	35.3
101-500	28	14.6	6,268	19.4	4433	3597	18.9
501 or more	12	6.2	20,035	61.9	6200	5794	6.6
Total	192	100.0	32,353	100.0			

*15.9 Tareas equal one hectare

production with an opportunity cost equal to the average salary for agricultural workers in the area, while in the second approach, family labor was assumed to have an opportunity cost equal to zero.

Total income, under the two different approaches to farm income, for sample households and for the region are presented in Table 3. Under the first approach, estimated mean household income is 1,841 pesos annually, and under the second approach, 1,897 pesos annually. The relatively small difference between the two approaches is, however, significant when sample results are extrapolated to the regional level. At the regional level, the annual difference between the two approaches exceeds 311,000 pesos. Under the first, more conservative of the two methods, total personal income in the Las Cuevas region is 10.3 million pesos. This more conservative estimate will be used for further discussions of income in the following sections.

Income by Source: Table 3 reports estimated income by source and the percentage of the total accounted for by each of the three sources for the sample households. As expected, farm income accounts for a relatively high proportion (50 percent) of total income. Nonfarm income and earnings by household members other than the head, respectively, account for 38 percent and 13 percent of total sample household income. Agriculture is an important source of income, and a high proportion of nonfarm income is earned by the household head.

Survey data allow the two major sources of income to be examined in more detail. Table 3 reports the three components of farm income as percentages of the total accounted for by each. More than 86 percent of farm income is accounted for by cash sales. This reflects the importance of marketing activities on the agricultural sector and on household income in the region regardless of the obviously underdeveloped state of the region. Production for self consumption represents a relatively small proportion (10 percent) of total income. This strong orientation of rural families to markets in the Las Cuevas region is similar to results reported for other areas in the Dominican Republic (Crouch *et al.*, 1983) and for other developing countries (Antonini, 1981).

The other important source of household income in the Las Cuevas region is off-farm employment of the household head (38 percent of total income). Major sources of such employment include hired agricultural labor, commercial activities, government employment and other activities such as charcoal production. Table 3 reports the contribution of each of these components to off-farm income.

All results confirm the importance of agriculture as an income source in the Las Cuevas Region and a general lack of non-agricultural employment opportunities. Further, reported income levels are low in both absolute and relative terms. The mean income of 1,841 pesos in Las Cuevas is significantly below the national average household income of 2,900 pesos and the national average rural income of 2,127 pesos (Espinal, 1983).

Distribution by Income Group and Land Holdings: Beyond the absolute levels of income reported in previous sections, the distribution of income by income group and the relationship between land holdings

TABLE 3

Distribution of Sample Household Incomes
with Projection to Las Cuevas Population

		<u>Pesos</u>	<u>Percent of Total</u>
Total Income of Sample Households		528,486	Income of Sample
Major Sources of Income			100%
	<u>Percent of</u>		
	<u>Major Source</u>		
Farm Income From Production		261,951	50%
Value of Cash Sales	86%		
Value of Production Consumed	10%		
Value Input Purchased with Production	4%		
Off-Farm Income (by Head)		199,590	38%
As Hired Farm Worker	39%		
Commercial Activities	20%		
Government Employment	34%		
Other	8%		
Off-Farm Income (by non-Head)		66,846	12%
Households in Sample (Number)	287		
Mean Sample Income*		1,841	
(Standard Error)		181)	
X			
Total Las Cuevas Households	5609		
=			
Total Las Cuevas Income		10,328,535	
(95% Confidence Bond)		(±1,974,147)	

*When family labor was assumed to have an opportunity cost equal to zero, sample mean income was 1897 pesos and total Las Cuevas income was 10,639,936 pesos or 3% more.

and income are important considerations from a policy perspective. Table 4 shows the distribution of income by 15 income groups in the Las Cuevas region and reveals considerable income disparity. Almost 55 percent of the households have income below the national poverty level, estimated by the Central Bank at 1,138 pesos annually (Espinal, 1983). Further, these households together earn only 16 percent of total Las Cuevas income. At the other end of the scale, 10 percent of households in the region earn more than 3,600 pesos annually and receive 40 percent of total income. Separate calculations indicate that approximately 29 percent of regional households are more than 50 percent below the national poverty level and together receive only 4.6 percent of total income. Approximately 31 percent of regional households are more than 50 percent above the poverty level and receive 72.8 percent of total income.

Due to the importance of agriculture in the Las Cuevas region, income also varies significantly with size of land holdings. Data reported in Table 2 reflect this relationship. Incomes are positively related to land holdings, and off-farm income as a percentage of total income declines significantly as land holdings increase. For the smallest size farms, off-farm sources account for 84 percent of total income. This percentage declines to only seven percent for the largest category of farms. Mean total income, on the other hand, increases more than five times from the smallest to the largest farm groups.

Concluding Comments

In conclusion, the data reported here for the Las Cuevas region of the Dominican Republic reflect income problems typical of many areas in that country and other countries in the same part of the world.

TABLE 4

Income Distribution by Group in the Las Cuevas Region,
Dominican Republic, 1981-1982*

Annual Income Group	Number of Households	Percent of Households	Mean Income	Group Income	Percent of Total Income
0 – 200	22	7.7	98.41	2165.12	0.4
200 – 1139	34	46.7	601.00	80533.80	15.2
1139 – 1200	10	3.5	1168.64	11686.40	2.2
1200 – 1800	42	14.6	1557.19	65401.85	12.4
1800 – 2400	20	7.0	2113.28	42265.50	8.0
2400 – 3000	17	5.9	2679.18	45546.04	8.6
3000 – 3600	14	4.9	3390.57	47468.00	9.0
3600 – 4200	7	2.4	3946.49	27625.43	5.2
4200 – 4800	5	1.7	4559.22	22796.10	4.3
4800 – 7200	5	1.7	5849.54	29247.70	5.5
7200 – 9600	4	1.4	8375.88	33503.50	6.4
9600 – 12000	2	0.7	10631.25	21262.50	4.0
12000 – 18000	3	1.0	14511.90	43535.70	8.3
18000 – 24000	1	0.4	31837.00	31837.00	6.0
Total	287	100.0	1814.42	528486.38	100.0

*All income figures in Dominican pesos.

In general, incomes are low in an absolute sense and relative to averages for the country as a whole. The data also reflect the importance of agriculture, both as a source of farm income and as a source of employment for regional household heads. Beyond the relatively low income levels, the Las Cuevas survey data also reflect large disparities among income groups within the region with a major determinant of income variation being variation in land holdings between households.

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