

**AGRICULTURAL, LIVESTOCK, METEOROLOGICAL AND SOCIOECONOMIC
INDICATORS, SOURCES, COLLECTION AND FLOW OF INFORMATION***

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SUMMARY

The paper presented herein pursues to characterize the agricultural, livestock, meteorological and socioeconomic indicators. The purpose is to consider their use in nutritional epidemiological surveillance, based on the hypothesis that they are relevant in those variables affecting food supply and demand to satisfy the nutritional requirements of the low-income populations in Central America. First, the physical framework of the region is characterized as well as the structure and dynamic conditions of the economy, bearing in consideration those variables that affect the development process, especially that of the agricultural sector. Generalization is made in a summarized form on the evolution of the agronomic production, on the situation prevailing in the agrarian structures, and on some aspects related to the social components which in one way or another affect the nutritional aspects and the quality and living conditions of the population. Among them, the following are cited: income, unemployment, education, food, health, and housing conditions. The presentation ends with a series of recommendations as to the need of unifying criteria in regard to the selection, study and presentation of the above-mentioned indicators, so that they may have a periodic, truthful, opportune, up-to-date and comparable diffusion for further use in the Latin American environment.

I. GENERAL DESCRIPTION OF CENTRAL AMERICA

Central America is composed of five countries, Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica in a narrow band extending North-East to South-East

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between the Atlantic and Pacific Oceans, limiting on the North with Mexico and on the South with Panama; its position between the Equator and the Tropic of Cancer imparts it the character of a torrid zone, a factor which is determinant of its climate.

Its territorial area measures 441,070 km² with a population which in 1970 totalled 15.0 million inhabitants. In 1975 this reached 17.6 million inhabitants, registering in 1970-75 a growth rate of 3.2%, which means that its demographic growth is one of the highest in the world.

A great migration from the rural to the urban areas is registered in the region. Thus in 1960 the urban population constituted 28.5% of the total population and in 1970 that relation was of the order of 33.5% with an increase index of 25.5%. Another important aspect is that around 60% of the Central American population is dedicated to agricultural activities.

Considered as one of the factors of the economic development process, the Central American population presents favorable characteristics. Among these it is worthwhile mentioning a rather elastic social stratification that permits its mobility – which is basic for economic growth – as well as its prompt adaptation to sudden changes and an adequate response to economic motivations.

On the negative side one should mention the very high demographic growth, a fact that merits great attention in view of the problems posed by housing, services and, mainly, the creation of new working opportunities. Furthermore, the present age structure overloads the economic activity to a relatively minor population together with a very low educational level.

Independently of the previous observations, Central America as a whole counts with great extensions of agricultural and forest land not utilized, which represent more or less twice the surface actually under any form of tenure.

II. INDICATORS ON THE EVOLUTION OF PRODUCTION *

A. *Evolution of Agronomic Production*

During the 1960-70 decade the agricultural and animal production grew at an annual rate of 4.4% influencing on such growth both the increment of the cultivated area as well as the improvements in land productivity.

Seventy-five percent of the Central American livestock production originates from net agricultural crops, whose growth during the decade was of 4.2%, although in the second quinquennium the rhythm of said production was only of 2.2 per year, due to the problems faced in regard to export crops, mainly that of cotton.

* See Tables 1 and 2.

TABLE 1
SOCIAL INDICATORS OF THE CENTRAL AMERICAN ECONOMY

CONCEPT	CENTRAL AMERICA	GUATEMALA	EL SALVADOR	HONDURAS	NICARAGUA	COSTA RICA
1. Agrarian Structure						
1.1 Territorial area (thousands of hectares)	42 311	10 889	2 114	11 173	13 055	5 080
1.1.1 Territorial area distributed in per cent according to its potential productive capacity	100.0	100.0	100.0	100.0	100.0	100.0
i Intensive use	12.0	14.7	31.4	7.8	6.0	22.7
ii Extensive use	23.0	27.0	3.1	9.2	32.1	29.7
iii Forest use	36.6	29.3	8.2	55.1	31.3	37.1
iv Combined forestry and agricultural use	5.7	—	—	0.9	17.5	—
v Very extensive use	22.7	29.0	57.3	27.0	13.0	10.5
1.2 Farm area (thousands of hectares)	14 542	3 752	1 646	2 462	3 939	2 743
1.2.1 Per cent utilization of farm surface	100.0	100.0	100.0	100.0	100.0	100.0
i Annual crops	14.0	18.2	18.5	14.9	10.8	9.3
ii Permanent crops	8.3	9.7	11.5	8.9	4.8	8.9
iii Pastures	43.2	29.8	42.5	50.4	51.8	43.0
iv Resting	7.5	8.3	9.0	7.9	7.1	5.7
v Wood and forest area	23.6	29.9	10.5	15.0	22.5	32.4
vi Other lands	3.4	4.1	8.0	2.9	3.0	0.7
1.3 Per cent distribution of land in farms by strata, 1970	100.0	100.0	100.0	100.0	100.0	100.0
1.3.1 From 0 to 4 hectares	6.6	12.3	13.6	6.3	1.6	1.8
1.3.2 From 4 to 35 hectares	20.2	21.4	21.9	33.5	13.1	15.7
1.3.3 From 35 to 350 hectares	35.2	23.9	33.6	32.7	44.1	41.1
1.3.4 From 350 hectares and more	38.0	42.4	30.9	27.5	41.2	41.4
2. Income Structure						
2.1 National income in 1960 (millions of SCA)	2 350.6	912.2	489.7	311.7	290.0	347.0
National income in 1972 (millions of SCA)	5 305.1	1 866.9	984.1	683.5	832.1	938.5
2.2 Mean income per capita in 1960 (SCA)	214.4	235.8	195.0	168.6	193.2	281.4
Mean income per capita in 1972 (SCA)	331.0	336.4	267.1	247.0	386.7	511.2
2.3 Estimation of per cent distribution of global income by strata, 1970	100.0	100.0	100.0	100.0	100.0	100.0
2.3.1 Low strata = 50% of the population	13.0	13.0	16.0	13.0	15.0	18.0
2.3.2 Middle strata = 30% of the population	26.0	24.0	24.0	24.0	25.0	26.0
2.3.3 High strata = 15% of the population	30.0	28.0	33.0	30.0	32.0	27.0
2.3.4 Very high strata = 5% of the population	31.0	35.0	27.0	33.0	28.0	29.0
3. Food and Nutrition						
3.1 Number of daily calories adequate for an adult person	2 500	2 500	2 500	2 500	2 500	2 500
3.2 Adequate daily proteins per person, g	65.0	65.0	65.0	65.0	65.0	65.0
3.3 Number of calories consumed daily per person, g (1970)	2 132	2 021	1 001	2 250	2 380	2 457
3.4 Proteins consumed daily per person, g (1970)	53.5	50.3	45.1	55.8	64.2	63.6
4. Professional Health Services in 1970						
4.1 Physicians per 10,000 inhabitants		2.5	2.3	2.7	5.1	5.5
4.2 Dentists per 10,000 inhabitants		0.6	0.8	0.6	1.2	1.4
4.3 Nurses per 10,000 inhabitants		1.5	2.4	1.3	2.3	5.7
5. Education						
5.1 Illiteracy rates in 1970	42.2	55.0	42.0	43.0	62.0	11.0
5.2 Absorption capacity rates of the educational system						
5.2.1 Primary level	53.9	35.2	54.0	65.5	47.3	67.4
5.2.2 Secondary level	23.7	19.4	24.0	13.9	20.7	40.6
5.2.3 High level	2.6	3.0	2.0	0.9	2.2	5.0
5.3 School desertion rates 1962-1967	13.7	16.2	9.4	24.0	24.5	6.0
5.4 School retention rates 1962-1967	24.3	18.1	29.6	18.5	14.0	43.3
5.5 School retention rates 1967-1970						
5.6 Per cent rate of passing students attending school 1962-1967	21.4	16.7	20.0	16.0	10.3	40.7
5.7 Evolution index of enrollment 1962 (based on 1960)	6.8	6.8	4.9	7.7	11.8	6.7
Evolution index of enrollment 1970 (based on 1960)	6.1	6.2	5.2	6.4	7.5	5.8
5.8 School-age population growth rate 1960-1970	3.8	4.5	3.4	2.9	3.2	4.4
6. Estimation of Housing Deficit						
6.1 Thousands of units in 1965 per 10,000 inhabitants	1 710.2	557.1	445.1	280.0	212.6	115.4
6.2 Thousands of units in 1970 per 10,000 inhabitants	2 115.8	764.2	520.2	368.5	269.9	193.0
6.3 Thousands of units in 1975 per 10,000 inhabitants	2 577.8	888.4	603.8	468.2	335.7	281.7

SOURCE: CEPAL. Situación y perspectivas del empleo juvenil en el Istmo Centroamericano, abril de 1972.
 CELADE. Boletín demográfico 1968, 1969, 1970.
 NACIONES UNIDAS. El Cambio Social y Política de Desarrollo Social en América Latina, 1969.
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TABLE 2
STRUCTURAL AND DYNAMIC CHARACTERISTICS OF THE ECONOMY

CHARACTERISTICS	CENTRO-AMERICA	GUATE-MALA	EL SAL-VADOR	HONDU-RAS	NICA-RAGUA	COSTA RICA
1. Population Indicators						
1.1 Total population in 1960 (thousands of inhab. at mid-year)	10 963	3 868	2 512	1 849	1 501	1 233
Total population in 1973	16 561	5 642	3 814	2 864	2 222	2 019
Total population in 1980	20 946	6 913	4 904	3 661	2 818	2 650
1.2 Mean annual pop. growth rates 1960-1970	3.2	3.0	3.2	3.4	3.0	3.8
Mean annual pop. growth rates 1970-1975	3.3	2.9	3.5	3.5	3.3	3.8
Mean annual pop. growth rates 1975-1980	3.4	2.9	3.7	3.6	3.5	3.8
1.3 Annual birth rates per 1,000 inhab. 1970-1975	45.0	41.6	46.5	48.5	46.8	44.5
Annual birth rates per 1,000 inhab. 1975-1980	44.5	40.4	46.3	47.7	47.4	44.1
1.4 Annual death rates per 1,000 inhab. 1970-1975	12.3	13.0	11.0	15.2	14.7	6.0
Annual death rates per 1,000 inhab. 1975-1980	10.8	11.3	9.4	13.6	13.1	5.4
1.5 Mean annual fertility rates 1970-1975	6.6	6.0	6.9	6.9	6.7	6.8
Mean annual fertility rates 1975-1980	6.4	5.7	6.9	6.7	6.7	6.6
1.6 Percentage of population under 14 years 1970	46.6	45.7	47.1	46.7	47.1	47.9
Percentage of population under 14 years 1980	46.0	43.4	48.3	47.0	46.1	47.5
1.7 Percentage of population over 65 years 1970	3.0	3.0	3.0	2.4	3.1	3.2
Percentage of population over 65 years 1980	3.0	3.0	3.0	2.4	3.0	3.3
1.8 Population density per km ² in 1960	26.2	35.5	119.9	16.5	12.7	24.2
Population density per km ² in 1970	36.1	47.7	164.4	23.0	17.1	35.3
Population density per km ² in 1980	50.3	63.5	234.2	32.7	23.8	52.1
1.9 Percentage of rural population in 1960	71.3	72.1	68.6	79.2	66.2	68.8
Percentage of rural population in 1970	66.4	68.9	62.1	72.3	60.0	66.0
Percentage of rural population in 1980	60.2	64.8	53.9	65.0	52.5	61.7
1.10 Life expectancy at birth 1965-70 (No. years)	54	51	55	49	50	67
2. Production Structure						
Total NGP 1972 (Millions of \$CA)	6 303.7	2 182.8	1 156.2	808.5	989.9	1 166.3
2.1 Agriculture, forestry, game and fishery	1 694.8	614.9	296.2	279.4	252.1	252.2
2.2 Mines and quarries	25.3	2.0	1.8	17.9	2.6	1.0
2.3 Manufacturing industry	1 104.8	351.0	220.1	120.6	187.7	225.4
2.4 Construction	211.8	41.7	39.7	40.0	30.1	60.3
2.5 Electricity, gas, water	95.5	24.4	17.7	12.0	19.6	21.8
2.6 Transportation	306.3	99.7	55.7	51.3	51.0	48.6
2.7 Commerce	1 369.8	613.6	259.1	101.4	200.4	195.3
2.8 Finances	155.6	36.5	28.1	23.7	25.7	41.6
2.9 Housing	381.2	143.6	43.9	63.9	58.6	71.2
2.10 Public and Defense Administration	444.2	117.9	95.3	29.4	61.2	40.4
2.11 Other Services	514.4	137.5	98.6	68.9	100.9	108.5
3. Total Balance of International Exchange Commerce, 1972 (Millions \$CA)						
3.1 Imports in real estate and Services (Millions \$CA)	1 767.3	451.6	331.8	241.0	298.6	444.3
3.2 Exports in real estate and Services (Millions \$CA)	1 583.5	398.4	337.4	218.7	291.0	338.0
4. Balance of Commerce with Central America, 1972 (Millions \$CA)						
4.1 Imports	305.7	68.8	74.4	22.4	60.8	79.3
4.2 Exports	305.7	106.5	85.1	7.1	56.7	50.3
5. NGP Growth Rate 1960-1972						
5.1 NGP Growth Rate 1960-1972	7.3	6.3	6.1	7.1	9.4	8.9
6. Distribution of NGP by inhabitant 1960 (\$CA)						
6.1 Distribution of NGP by inhabitant 1960 (\$CA)	248	270	226	192	224	339
7. Distribution of NGP by inhabitant 1972 (\$CA)						
7.1 Distribution of NGP by inhabitant 1972 (\$CA)	393	398	314	292	460	601
8. Growth Rate of Agricultural NGP 1960-1972						
8.1 Growth Rate of Agricultural NGP 1960-1972	6.4	6.3	4.3	5.4	10.1	7.9
9. Growth Rate of Industrial NGP 1960-1972						
9.1 Growth Rate of Industrial NGP 1960-1972	9.3	8.4	8.5	9.7	11.0	10.0

NGP = National gross product.

SOURCE: CEPAL. *El empleo y perspectivas del empleo juvenil en el Istmo Centroamericano*, abril de 1972.
 CELADE. *Boletín demográfico 1968, 1969, 1970*.
 NACIONES UNIDAS. *El Cambio Social y Política de Desarrollo Social en América Latina, 1969*.
 GAFICA. *Datos de Población. Volumen II. Marco Cuantitativo. Diciembre de 1972*.
 SIECA. *50. Compendio Estadístico Centroamericano*.
 CEPAL. *Consideraciones sobre la situación del empleo en Centroamérica*.
 UNICEF, SIECA, ODECA. *Las Sociedades Centroamericanas Actuales*.
 NACIONES UNIDAS. *Los recursos humanos en Centroamérica. Panamá, México y sus relaciones con algunos aspectos del desarrollo*.

In regard to the agricultural production value, the exportation articles represent more than 50% of the production. Of these, sugar cane registers a greater index of internal consumption, since 70% of the sugar production was destined to internal consumption, while in regard to coffee, banana and cotton, the internal consumption was less than 15% of the total production.

In 1970 the main products of domestic consumption such as cereals, roots and tubers, and fruits and legumes, occupied more than 60% of the cultivated area, but represented 25% of the gross value of the total crops in general.

On the other hand, export products occupied less than 30% of the cultivated area and generated more than 50% of the gross production value; this fact is not attributable only to the price structure but also to the land quality and to the technology employed in their production.

Among the basic grains, rice had a greater percentage increment during the 1960-70 decade (46.8%) and corn had the lesser increase (2.8%). Within the export crops, banana was the highest, with a yield increment of 93%, while that of cotton was only of 8.1%.

B. Indicators on the Use of Physical and Mechanical Inputs

The use of fertilizers is observed mainly in plantations whose surface surpasses 35 hectares, which absorb more than 80% of the total input employed. Although the use of tractors in agriculture is low in a proportional relation to its employment in other Latin American countries, it has notably increased during the last years.

C. Evolution of Animal Production

During the 1960-70 decade the animal production value registered an annual growth rate of 5%. The main factor for this growth was the expansion of beef production which, in turn, represented two-thirds of the animal production in 1970, with an annual growth rate of 5.2% in the above-mentioned decade. In contrast, the avicultural and porcine production registered growth rates of 4.7% and 4.1%, respectively.

The birth index of bovine cattle is below that registered in Latin America, varying between 21.5 to 27.2 per cent.

In physical terms, with the exception of Costa Rica, bovine growth rate was lower than the population growth rate, and the pasturing index remains under one head per hectare in a clearly pasturage-feeding system.

D. Indicators of the Agrarian Structure

Because in the prevailing agricultural and animal census of Central America

there are no farms (fincas) coinciding insofar as their tenure characteristics are concerned, with regard to the classification defined by the Inter-American Agricultural Development System (CIDA), the following designations that homogenize the size structure of the exploitations have been adopted:

1. **Minifarms:** very small units, the extension of which is below that of a block, and which in general cannot be classified as fincas. This is the case of small farms and orchards that frequently are dedicated to the cultivation of vegetables for personal autosupply.

2. **Subfamily Units:** land surfaces that are not sufficient to satisfy the minimal needs of a family with regard to utilization of labor and income.

3. **Family Units:** land surfaces whose extension is sufficient for labor and family sustenance, in accordance to predominating techniques.

4. **Medium and large Multifamily Units:** land surfaces which require the employment of paid labor in addition to family labor.

In agreement to available censal information, representations of the number and occupied surface areas were obtained following the previous classification, as cited herein:

1. **Minifarms:** represent 24.1% of the total of fincas (plantations), and occupy 0.7% of the total surface area.

2. **Subfamily Units:** represent 54.8% of the total, and occupy 9.1% of the surface.

3. **Family Farms:** represent 15.0% of the total, and occupy 16.2% of the surface.

4. **Multifamily Units:** represent 6.1% of the total, and occupy 74.0% of the surface.

From the above statements, one can see that 93.9% of the farms occupied 26.0% of the land surface, while 6.1% of the farms occupied 74.0% of the land. In addition, it has been observed that the subfamily farms dedicate 81.0% of the surface mainly to transitory crops, while in the multifamily units only 9.4% is utilized. The latter is indicative of the fact that even in the case of lands under certain tenure forms, in Central America there is sufficient surface which is being used with a marginal advantage, or simply is not under economic exploitation.

For complementary purposes, it is necessary to point out that food production is concentrated in more than 80.0% in the smallest farms – less than 7 hectares – while the larger ones are dedicated to pasture and export crops.

The most common form of land tenure in the region is as follows:

- a) Private property: represents 44.8% of the total;
- b) Land rented: represents 36.0% of the total; and
- c) Mixed forms (include common land): represent the remaining 19.2 per cent.

E. Source, Collection and Flow of Information

The basic information source of the agricultural and animal production in Central America is obtained from the agricultural and animal census, which supposedly should be carried out every 5 years; however, as of 1950 to date, only four census have been carried out in Costa Rica and three in the remaining countries of the region.

In a complementary way, the Directions of Statistics and decentralized organizations carry out annual production surveys of the basic food products and of export products, which, as in the case of the census, are published rather late.

In the field of research and publication of indicators at national level, universities, central and fomentation banks, as well as private institutions play a very important role.

At the regional level there exist a series of agencies that carry out research in this area and the results of which constitute a valuable information source. Among these, the following should be cited: the Permanent Secretariat of the General Central American Economic Integration Treaty (SIECA), The Central American Bank for Economic Integration (CABEI), the Inter-American Institute for Agricultural Sciences (IIAS); the Institute of Nutrition of Central America and Panama (INCAP) and other international organizations such as the Food and Agriculture Organization of the United Nations (FAO) which, in one way or another, are linked or assess the integration process and are related to the agricultural field.

Finally, during the present year the Agricultural and Animal Information Program of the Central American Isthmus (PIADIC) of the IIAS, with headquarters in San José, Costa Rica, initiated its work. Its objectives are to strengthen the national agricultural and animal information systems and create a regional data bank for the purpose of generating a permanent and dynamic flow of information of agricultural socioeconomic character.

III. SOCIOECONOMIC INDICATORS OF CENTRAL AMERICA*

The indicators presented further on are those considered as compatible with the

* See Table 2.

economic goals of the strategy of integrated social development of Central America.

The economic situation of Central America has reached a developmental degree influenced mainly by the great effort made within the economic integration process, which has turned the situation towards a take-off position, overcoming obstacles and solving problems that 10 years ago were considered as unsolvable.

A. *Social Matters**

At the initiation of the integrationist scheme, the socio-political aspects were handled by the Organization of Central American States (ODECA), which published technical monographs containing very valuable social indicators which should be updated. INCAP has dedicated great efforts to research in nutrition and health, achieving important discoveries that could well be the basis to correct the maladjustments in such subject matters today.

B. *Income Distribution**

According to SIECA/GAFICA estimates, in 1970, 50% of the Central American population perceived 13.0% of the general total income for economy, which means an annual *per capita* income of \$CA 74.00 while 5.0% of the population perceived 31.0% of the income with a *per capita* income of \$CA 1,760.00. It is possible that this situation has been modified during the last years as a consequence of the reduction of the real income of the majority of the population due to the effect of the world inflationary process.

C. *Unemployment and Underemployment*

In 1970 the estimated unemployment index was of 8.5% of the economically active population, which in absolute terms represent around 445 thousand unoccupied persons. This situation is still more severe if one realizes that the demographic expansion is greater than the absorption capacity that is being generated in the production system. For example, in the agricultural sector the real working offer covers 1.7 million persons, while the working force is of 3.2 millions, a figure which indicates that 1.5 million are in underemployment conditions.

D. *Education*

The primary school index was of 53.9% in 1970, which means that, for several reasons, 46% of the school-age children did not inscribe in the primary school. Among the several responsible causes one must cite the lack of capacity of the system and the fact that within the agricultural population, a greater number of children work in field activities, even as paid laborers instead of attending school.

* See Figure 1.

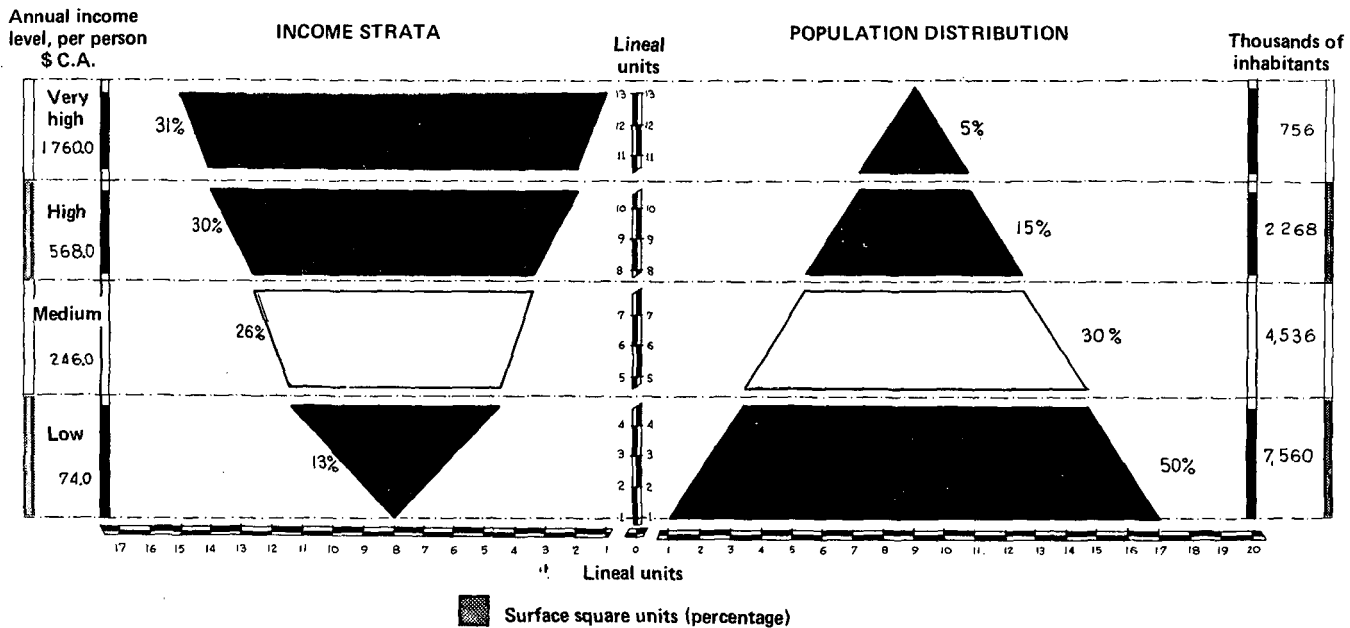


Fig. 1. Central America: per cent distribution of income in relation to the population, 1970.

This situation is aggravated if one considers that of the 100% population registered for primary education, only 21.4% finishes the sixth grade, facts from which a desertion of great proportions can be determined. On the other hand, of the 100% registered in the medium and superior-level schools, only 23.7% and 2.6%, respectively, finish their schooling.

Illiteracy in 1970 reached 43%, and of the economically active populations two-thirds of it do not have any school instruction.

E. Food, Nutrition and Housing

Studies carried out by INCAP determine that the nutritional status of the Central American population is considered highly deficient, since according to average estimates of minimal calorie and protein consumption, as compared with those reached in 1970, so demonstrate it:

<u>Consumption</u>	<u>Minimum of adequacy</u>	<u>Actual degree reached</u>
Daily calories	2,500	2,132
Daily proteins	65 grams	53.5 grams

It has been recognized that if no extreme measures are taken, the situation tends to drastically increase, if one takes into account the fact that the prices of products of popular consumption have raised in a more than out of proportion form with regard to that registered in the actual income of the majority of the population.

F. Housing

In agreement with available censal information and with the projections carried out, in 1970 it was estimated that the housing deficit in the region reached 1.5 million dwellings. This situation has been ostensibly aggravated by the disasters that occurred during the past five years, such as the earthquakes in Nicaragua and Guatemala, and the hurricane in Honduras.

G. Flow and Sources of Socioeconomic Information

The source and flow of information of the socioeconomic indicators are very similar to the detailed for agricultural and animal production. In addition, periodic research is carried out also on these subjects, among which one should state, at national level, those carried out by the economic and social research institutes of the respective autonomous and private universities.

In the field of its competence, the Institute of Nutrition of Central America and Panama has carried out a research task of immensurable value achieving discoveries that are known and put into practice not only in the Central American Isthmus but in the whole world. These constitute one of the most valuable information sources, both in the field of nutrition as well as in other social areas.

Finally, it is worthwhile pointing out that at present an integral study is being conducted in Central America on the situation of the peasants in the rural area that transcends the establishment of simple indicators. This obeys to the fact that in its realization, the socioeconomic structures and their behavior in the development process will be identified, as well as those research studies that determine the behavior of the field workers, among others, their aspirations, their attitudes towards the change processes and their degree of social participation. In this manner it is pretended to give form to the factors that contribute to define the quality and conditions of their respective interrelations in the Central American agro.

IV. METEOROLOGICAL INDICATORS OF CENTRAL AMERICA

With the assistance of the United Nations Development Program, as of March 1972 the Central American hydrometeorological service which includes Panama, was established. This constitutes the fundamental structure to coordinate the research work of the program at area level in this field.

With the above-mentioned program 282 main hydrologic basins, 121 of which are located in the watersheds of the Atlantic Ocean and 166 in the Pacific have been detected.

In accordance to the importance of the watersheds and the own needs of each region, numerous climatologic stations have been established. These are classified as Main, Ordinary and of Precipitation observation, where observations of elements such as precipitation, humidity, cloudness, temperatures, time characteristics, duration and velocity of winds, etc. are carried out.

In addition, Central America counts with 219 stations for measuring the water volume of the rivers, where they determine the quality of the waters, the maximum, medium and minimal volume per hours, days, etc., as well as measurements of sediments in suspension, conductivity, acidity (pH) etc. Furthermore, measurements of the levels of all lakes and lagoons existing in Central America are also taken.

All the reference information is published in Meteorological and Hydrologic Yearbooks where monthly tables are presented informing as to the daily situation concerning each of the elements observed. Nevertheless, its printing is made quite tardily and for this reason it constitutes a historic account for the researcher.

V. RECOMMENDATIONS

In accordance with the concepts expressed in the present document, it is evident that there are, on the one hand, subnumbering and disparities in the agricultural and livestock census of Central America, in order to measure in a comparable form those aspects related to *agricultural and animal production* indicators.

Likewise, the lack of compliance with the agreement to carry out every five years an agricultural census at each country's level is evident, searching the means of increasing its content and coordinating it in its highest expression. On the contrary, some of the more recent census have in essence unequal and different contents and even limitations in regard to the information they supply.

In this manner, it is timely to point out that in order to reach the determined degrees of development achieved by the five countries, which have different advancement levels, for the purpose of attacking in each one of them the problems they face, and that in some way constitute barriers to initiate their take-off, it is necessary that research, especially the agricultural and livestock census, have the greatest degree of comparability and content.

In this context, it would be desirable that such census permit determination of the following aspects in a comparable form:

- Comparable tenure characteristics, detailing their prevalence in those cases such as leasing and mixed forms.

- Degree and characteristics of the utilization of family labor according to the size of the exploitations.

- Characteristics of production according to the farm area and land tenure.

- Availability of agricultural land according to the tenure forms of the exploitation unit.

- Availability of agricultural tractors, equipment, production implements and quality of storage facilities, according to the exploitation size.

- Use of input and credits according to the products and size of the exploitation.

- Degree of agricultural investment and capital according to the size and form of land tenure,

- Destination of the products according to the size and tenure of the exploitations — human and animal consumption, destined for sale and for seed.

Of no lesser importance, it would also be convenient to carry out every five years family income and expenditure surveys, for reasons of residence, in order to determine the degree of consumption improvement or deterioration and of the actual income of the population, as well as on the relevant characteristics of conditions and quality of life, especially in the rural sector.

In view of the fact that, as already mentioned, the information on indicators is provided at a rather late date, it would be convenient to recommend that the flow of same be more dynamic and permanent, as well as periodic, reliable, up to date and comparable. Hence, the suggestion of supporting regional institutionalization in all its magnitude, formulated by the Agricultural and Animal Production Information Program of the Central American Isthmus – PIADIC – once the external financial aid has fulfilled its period of assistance, which has been determined to be of 3 years.

It would also be convenient to carry out the updating of the document “Statistics on Food and Agriculture in Central America” whose actual content comprises the 1960-1970 decade. This constitutes a valuable and wide-detailed statistical information source on the production and consumption of a considerable number of primary food products and their byproducts.

Finally, it would be convenient to perform meteorological studies to determine, if possible, states of alarm in regard to droughts or in the case of the excessive rains which frequently affect the Central American agricultural production. On the basis of these studies, it would be feasible to determine the establishment of contingency inventories of the main foods of popular consumption, in particular the basic grains – corn, beans, rice and sorghum – in order to face the emergency situations that in the past years have been a prevalent factor in the Central American area.

RESUMEN

INDICADORES AGROPECUARIOS, METEOROLOGICOS Y SOCIOECONOMICOS, FUENTES, RECOLECCION Y FLUJO DE LA INFORMACION

La ponencia persigue caracterizar los indicadores agropecuarios, meteorológicos y socioeconómicos, con el fin de considerar el uso de los mismos en la vigilancia epidemiológica nutricional, partiendo del supuesto que son relevantes en aquellas variables que afectan la oferta y la demanda de alimentos, para satisfacer los requerimientos nutricionales de la población de bajos ingresos en Centro América. Inicialmente se caracteriza el marco físico de la región y las condiciones estructurales y dinámicas de la economía, teniendo en cuenta aquellas variables que inciden en el proceso de desarrollo, en forma especial del sector agrícola. Se generaliza en forma resumida, sobre la evolución de la producción agropecuaria, la situación que prevalece en las estructuras agrarias, así como en algunos aspectos relacionados con los componentes sociales que de alguna manera inciden en los aspectos nutricionales y en la calidad y condiciones de vida de la población, tales como el ingreso, el desempleo, la educación,

la alimentación, la salud y la vivienda. Se concluye haciendo una serie de recomendaciones sobre la necesidad de unificar criterios en cuanto a la selección, el estudio y presentación de los indicadores señalados, a efecto de que los mismos tengan una divulgación periódica, veraz, oportuna, actualizada y comparable para usos ulteriores en el ámbito latinoamericano.

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