

UNESCO/SS/URB/IA/22  
PARIS, 29 April 1959  
Translated from the Spanish  
General  
E/CN.12/URB/22

UNITED NATIONS EDUCATIONAL,  
SCIENTIFIC AND CULTURAL ORGANIZATION

SEMINAR ON URBANIZATION PROBLEMS IN LATIN AMERICA

Sponsored jointly by the United Nations Educational, Scientific and Cultural Organization, the United Nations Bureau of Social Affairs and the Secretariat of the Economic Commission for Latin America, in co-operation with the International Labour Office and the Organization of American States.

Santiago, Chile, 6 to 18 July 1959.

The Urbanization Process in Atlixco and Ciudad Sahagún.

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Note by Unesco: The author will give further information orally during the seminar.

Any comparative study of the urbanization process set in motion by industrialization in two different zones must begin by explaining the significant differences between the two regions to which the analysis relates.

The surveys in Atlixco and Ciudad Sahagún are comparable in very few respects. The first was undertaken in connexion with a problem of labour mobility, the shift of manpower from the village to the factory; in the second, the main points investigated bore on the change over from a former pattern of urban life to a new one created by the settlement of workers of differing origins in a planned city.

Since the objects of the surveys were different, it is proposed to refer to that on Atlixco solely as confirmatory evidence on those points at which the two surveys coincide, using the Ciudad Sahagún survey to give a brief account of the urbanization problems so far investigated in this country.

Atlixco, situated in the middle of Puebla State, lies about 50 miles due south of Mexico City and four hours car drive away by the Pan-American Highway.

It is the most important urban centre of a region comprising 31 municipalities with a population of over 220,000 (1950 census).

Ciudad Sahagún is about 65 miles east-north-east of Mexico City, in Hidalgo State, and is reached by the Veracruz Highway, via Texcoco. Building work there began in 1953 and it has now become the most influential urban centre of a small region containing four municipalities with a population of 23,895 (1950 census).

In both regions, 74% of the working population is employed in agriculture; that is to say, the populations of both regions comprise a percentage of agricultural workers above the national average of 64%.

In the Atlixco region, 14% of the working population are in factories as against 9% in the Ciudad Sahagún area. The average percentage of factory workers over the nation was 16% in 1950, though it must be pointed out that at that date no new industries had been introduced into the Ciudad Sahagún area nor had the building of the city been begun.

In the pre-Spanish period, both regions were in the Nahuatl zone; today they are to a great extent integrated into the body of the nation.

At the time of writing, 4% of the population still speaks Nahuatl in the Atlixco region but it is not spoken at all by the people in the Ciudad Sahagún area.

In neither region is there the industrial diversity which could give rise to the development of self-sufficient regional trading areas; on the contrary, both regions are integrated into the national economy on both the production and consumption sides.

Atlixco is the largest trading centre of the region, and the two weekly markets held are attended by peasants from all 31 municipalities, who come to sell their agricultural produce and purchase their week's supplies. The town is the centre for fruit and vegetable merchants, who buy in small parcels from hundreds of growers and take their purchases out to Mexico City and other urban consumers.

The non-agricultural commodities bought and sold in this market are products of nation-wide industry so that it has the characteristics not of a closed-circuit regional market but of a component in the national trading network.

Ciudad Sahagún lies at no great distance from a number of towns - Chiconcuac, Apam and others - which in the past were regional trading centres but have been progressively declining from that status as a result of the displacement of hand-made by factory-made goods.

Ciudad Sahagún is increasingly becoming a retail and trading centre for goods from all parts of Mexico.

The social situations, into which the industries starting the urbanization process were introduced, differed materially in the two regions.

In Atlixco it was at the end of the last century - when Mexico had its period of prosperity and expansion in the textile industry - that the first factories were started, and they came to a region with a balanced and prosperous agricultural economy, with large estates, sugar plantations, and a range of crops.

In the Ciudad Sahagún area in 1950, several factors had combined to cause a breakdown of the agricultural economy; the soil was poor and eroded; agrarian reform had stopped half way for lack of funds, and maguey preponderated over the other crops grown. With the government currently endeavouring to create Mexican industries, an economically stagnant region was an obvious choice as a site.

In Atlixco, what attracted the mills was the availability of water, one of the essentials for textile industry.

In Ciudad Sahagún the local industries sprang from the need to disperse the concentration of industry in Mexico City; and the factors determining the choice of this spot were its position at the junction of the important railroads from the capital to the port of Veracruz and the Northern States respectively and the proximity of the gas pipeline to Mexico City and the high-tension cables taking power from Necaxa to the capital.

In consequence of these disparate circumstances, we have two quite different types of urbanization: it was spontaneous and slow in Atlixco, with a strong subsisting Indian tradition; while in Ciudad Sahagún we get a high-speed managed process among people representative of a range of workers' and technicians' milieux drawn from all over Mexico and from abroad.

The kind of urbanization consisting mainly in a shift of labour from agriculture to industry is best evaluated in the Atlixco region, where there has been no increase in the number of industries and the pull of the five mills founded in the region at the end of the last century has reached its limit. In Ciudad Sahagún on the other hand, the process we find is the shift of workers from one industry to another. However, taking the region as a whole, the phenomenon observable is identical with that in Atlixco: absorption of the agricultural worker into industry.

A large proportion of the peasants changing over to factory work in Atlixco kept their smallholdings or went into the factory with the object of saving part of their wages to buy land.

Thus the traditional regional homestead - dwelling house, flowered patio, small hen-run, pigsty and orchard - remained unchanged in the villages and even increased with the earnings of the smallholder-factory worker.

The dwellings provided by the companies for their workers were built to the urban housing pattern prevalent at the beginning of the century; two rooms, kitchen with coal stove, and patio, with laundry places and water closets shared by groups of 20 or more households. Many workmen gave up these houses for cabins on land nearby where they could grow vegetables and keep livestock, so that a kind of semi-rural hamlet grew up round the factory. This is the basis for the statement that there is a qualitative difference between Atlixco and Sahagún: the former has developed spontaneously, as a result of sustained association between the Indian nuclei and the non-Indians engaged in the local industries, into a city pattern with a fairly stable mixture of urban and rural features. Ciudad Sahagún on the other hand follows modern town planning and housing practice, with a functional rectilinear layout, open spaces and all the municipal services expected in a modern town.

The experience of the use of methods and techniques afforded by the Ciudad Sahagún survey may be worth bearing in mind for future studies of the same kind.

It relates to two points:

- I. The use of an objective yardstick, based on analysis of consumption of a range of services, to define a community's degree of urbanization, which might replace the distinction between "urban" and "rural" based on size of settlement.
- II. The indirect measurement of the changes in customs brought about by changes in the degree or details of urbanization affecting family life.

We feel that the demographic yardstick universally accepted to distinguish between "urban" and "rural" and based on the numbers of inhabitants in a particular place does not meet the requirements of a concrete and reasonably thorough study undertaken for practical ends. To characterize the urban state we compiled a list of material facilities peculiar to town life, which represent a range of municipal, recreational and commercial services; on this basis we established a scale of decreasing degrees of urbanization marked by the absence of more and more items down to zero, which we defined as the rural state.

The "indicators" used in our survey were the following:

#### Trading Services

1. Manufacture and repair of furniture and household articles.
2. Repair of machinery, instruments and apparatus.
3. Manufacture and repair of clothing.
4. Building repairs.
5. Open air market (on a fixed day of the week).
6. General stores.
7. Specialized shops.
8. Covered market.
9. Supermarkets.
10. Banks.

Municipal Services<sup>(1)</sup>

11. Piped water.
12. Electric light.
13. Paved streets.
14. Street cleaning.
15. Sewerage and sidewalks.
16. Postal facilities.
17. Telegraph office.
18. Telephone system.
19. Public transport.
20. Railway links.
21. Airlines.
22. Planimetry.

## Recreational Facilities

23. Social clubs.
24. Sports clubs.
25. Spectator sports.
26. Parks.
27. Games saloons.
28. Cinemas.
29. Theatres.
30. Concert halls.
31. Dance halls.
32. Cabarets.
33. Bars.
34. Brothels.

Using these 34 indicators, an attempt was made to determine the level of urbanization of the various localities whence the citizens now settled in Ciudad Sahagún originally came.

For scaling purposes five grades were adopted, ranging from highly urbanized to rural according to the number of items present. The grades are as follows:

- I. Highly urbanized = 30 or more items.
- II. Urbanized = 20-29 items.
- III. Semi-urbanized = 10-19 items.
- IV. Semi-rural = 1-9 items.
- V. Rural = 0 items.

This scale allowed of a relatively objective assessment of the degree of urbanization of different centres of population and hence of the difference between workers' former and present "urbanization status", without regard to the population of their places of origin.

(1) For this part of the investigation, only those services were taken into account which are indicative of specific stages of progress; cemeteries, etc. are therefore omitted.

In terms of our scale, the ranking of the home areas of Ciudad Sahagún workers is as follows:

Highly urbanized:	Mexico, D.F.; Puebla, Pue.; Saltillo, Coah.; Veracruz, Ver.; Orizaba, Ver.; etc.
Urbanized:	Real del Monte, Hgo.; Apam, Hgo.; Tlalpujahua, Mich.; Ciudad Cerdán, Pue.; Tula, Hgo.; San Luis de la Paz, Gto.; etc.
Semi-urbanized:	Tlanalapa, Hgo.; Zempoala, Hgo.; etc.
Semi-rural:	Tepeyahualco, Hgo.; San José de la Unión, Hgo.; San Antonio, Mex.; Santa Cruz, Tlax.; etc.
Rural:	A ranch in Guerrero State.

We consider that our scale was not plotted scientifically, since an arbitrary value of one was given to each urbanization indicator, whereas they should have been weighted and higher values given to those basic to the urbanization process; we feel that one of the proper tasks for the present meeting is the establishment of a scientific scale to designate the degrees of urbanization of different localities. In this connexion, the Mexican Directorate-General of Statistics has compiled a questionnaire to elicit the socio-economic characteristics of all centres of population of over 500 inhabitants, with a view to rating them in terms of urbanization features and grading them on homogeneous qualitative data as first, second and third category urban, semi-urban and rural centres respectively.

The purpose of this questionnaire is both to prepare the ground for the 1960 census by classifying all centres of population according to their balance of urbanization features, and also to evaluate the individual traits.

It falls into two main sections, one to elicit general characteristics, and the other, and larger, to extract data on the specific socio-economic features under the thirteen sub-sections of streets, housing, drinking water, lighting, schools, welfare, transport and communications, main public services, other services, the main sources of revenue of the locality, agriculture and stock-raising, manufactures and commerce.

In Ciudad Sahagún, the investigation was carried out on a sample of 50% of the houses in those districts of the city already occupied, and thus covered approximately half the population resident in the city.

Sampling was effected on a random basis from two lists of numbers corresponding to street numbers, series "A" beginning with 1 and series "B" beginning with 2.

The streets of each district were allocated, turn and turn about, to series "A" and series "B" until all were accounted for.

Then the investigators started with number 4 in series "A" streets (number 3 in series "B") and interviewed all the residents in alternate houses up one side of the street and down the other, giving the following scatters:

Series "A": Odd numbers: 1, 5, 9, 13 .....  
 Even numbers: 4, 8, 12, 16 .....  
 Series "B": Odd numbers: 3, 7, 11, 15 .....  
 Even numbers: 2, 6, 10, 14 .....

In terms of original background as defined by our scale the composition of the Ciudad Sahagún population is as follows:

Highly urbanized	65.80%
Urbanized	19.70%
Semi-urbanized	10.41%
Semi-rural	3.72%
Rural	0.37%

The hypothesis formulated for the purposes of the Ciudad Sahagún investigation was that a state of social disorganization may be expected in any new industrial centre, which is surmountable to the extent that city-pattern services consonant with the type of relations arising from industrialization are instituted; but, in doing this, account must be taken of other factors, such as variations in the manners and customs of the new population according as their background is rural or represents a given level of urbanization. We assumed the degree of disorganization in Ciudad Sahagún to be minimal as many services were available ab initio, since City and factories were built concurrently. Moreover, the bulk of the new population, 85.50% come from highly urbanized and urbanized centres and its manners and customs are not rural.

Another subject considered was that of the changes of occupation which had occurred on settlement in Ciudad Sahagún.

	Labourers	Office workers	Artisans	Peasants	Technicians	Others
Former Occupation	40.50%	22.30%	9.67%	6.69%	7.43%	13.11%
Present Occupation	59.11%	29.37%	0.0%	0.0%	7.06%	4.46%
Shift	+18.59	+7.07	-9.67	-6.69	-.37	-8.65

The inferences to be drawn from the table are the following:

1. The labourer section of the Ciudad Sahagún population has gained 18.59% from the artisan, peasant and miscellaneous categories;
2. The clerical category has gained 7.07% from the labourer, artisan and other categories;
3. The percentage of technicians remains about the same, with a decline of 0.37% only.

4. No persons earning their living as peasants or artisans are at present resident in the city.

A fact emerging from the foregoing is that the removal of workers to Ciudad Sahagun involved minimal changes of occupation and accordingly the social problems arising out of such changes were likewise minimal.

Another point studied was the changes in family revenues, observing that the offer of higher wages is the primary incentive whereby a new undertaking assembles the labour force it needs.

GROUPINGS ACCORDING TO LEVEL OF MONTHLY EARNINGS

	-199	200-399	400-599	600-799	800-999	Over 1000
Previous proportion	4.09%	11.90%	17.10%	14.13%	7.43%	13.01%
Present proportion	.74%	9.67%	23.05%	22.30%	15.91%	24.91%
Shift	-3.35%	-2.23%	+5.95%	+8.17%	+8.48%	+11.90%

This table shows the first two, low salary, groups to have shrunk, whereas the groups earning 400 pesos a month and over show increases as high as 11.99%.

However if we take only those workers who originally came from highly urbanized centres we find that the percentages of numerical increase are greater in the upper wage brackets:

PERCENTAGE OF WORKERS

<u>Salary bracket</u>	<u>Numerical rise</u>
Over 1,000 pesos	132%
800 to 999 pesos	82%
600 to 799 pesos	37%
400 to 599 pesos	1%

The foregoing analysis would suggest the conclusion that the low salary groups have disappeared in the Ciudad Sahagun area; the facts are otherwise. Undoubtedly wages in the region have risen considerably if we compare them with those formerly paid in ranching and pulque production, before the establishment of the new industries, but the effects of these rises can be better appreciated in the peasant villages of the region, to be surveyed later, whence come the bulk of the workmen employed in the factories; their wages are not high if compared with those received by workmen in other industrial centres. What may perhaps have occurred is that wage rate curves have been made steeper to attract skilled workmen, with above-average rates for technicians and office workers but not for the bulk of the labour force. Which amounts to saying that the numbers of lower-paid workers



resident in the city are small and the bulk of the factory labour in the bottom wage groups still have their homes in the villages round about.

This tendency for the higher-paid workers to be concentrated in the city widens the division between the extra-regional workers and the ex-peasants living in the neighbouring villages, with a wealthy city on the one hand, and, on the other, a succession of impoverished villages at its very gates to which the advent of the factories will have brought little or no benefit. This state of affairs calls for a regional planning operation to promote concerted progress by the city and its village neighbours.

The evaluation of the possible changes in the mores of a population changing its "urbanization status" was based on an analysis of the ways of performing a series of functions for the satisfaction of biological needs or needs arising from community living, these modes of performance being then compared with those followed prior to settlement in Ciudad Sahagún, to establish the index of change. The functions selected were:

Sleeping, eating, evacuating, ablutions, cooking, laundry, ironing, "lounging" storing goods.

A scale of values was drawn up for each function on the basis of two criteria, hygiene and convenience, with the highest value assigned to the most healthy and convenient means of satisfaction and the lowest value to the means least satisfactory by reference to the above criteria.

Five levels of satisfaction are distinguished for each function.

#### FUNCTIONS AND LEVELS OF SATISFACTION

##### SLEEPING:

5 points: Room used solely as a bedroom, bed, satisfactory temperature;  
4 points: Same, but unsatisfactory temperature; 3 points: Bed, satisfactory temperature; 2 points: Bed, unsatisfactory temperature; 1 point: satisfactory temperature.

##### EATING:

5 points: Separate dining room, table service, cutlery; 4 points: Special dinner table and chairs, table service, cutlery; 3 points: Table and chairs, table service, cutlery; 2 points: Table and chairs, crockery; 1 point: crockery.

##### EVACUATION:

5 points: Pedestal water closet; 4 points: Earth closet; 3 points: Latrine; 2 points: Special place, no latrine; 1 point: open fields.

##### ABLUTIONS:

5 points: Indoor piped hot and cold water, separate room; 4 points: Indoor piped cold water, plumbing, separate room; 3 points: Indoor piped cold water special room; 2 points: Indoor piped cold water; 1 point: Water brought from outside the house.

COOKING:

5 points: Special room, gas cooker; 4 points: Special room, oil cooker;  
3 points: Special room, coal stove; 2 points: Special room, wood stove;  
1 point: No special room.

LAUNDRY:

5 points: Automatic washing machine; 4 points: Semi-automatic washing  
machine; 3 points: Hand operated washing machine; 2 points: laundry;  
1 point: Outside laundry place.

IRONING:

5 points: Electric press, electric iron, ironing-board, ironing room;  
4 points: Electric press, electric iron, ironing-board; 3 points: Electric  
iron and ironing-board; 2 points: Electric iron; 1 point: Flat iron.

LOUNGING:

5 points: Separate room, sitting-room suite, ornaments, carpets; 4 points:  
Separate room, sitting-room suite, ornaments; 3 points: Separate room,  
chairs, ornaments; 2 points: Separate room, chairs; 1 point: No separate  
room.

STORAGE:

5 points: Refrigerator, closets, wardrobes, china cupboards; 4 points:  
Closets, wardrobes, china cupboards; 3 points: Wardrobes, chests of  
drawers, chests; 2 points: Chests of drawers, chests; 1 point: No  
satisfactory storage.

These scales enabled us to determine statistically the differences between  
an individual's present and former situation in respect of the mode of satisfac-  
tion of certain needs.

The method of evaluation was to compare the arithmetical means of the two  
ranges of point values and then determine whether the difference between the two  
(found in every instance) was significant or not by comparison with twice its  
standard error, a plus or minus difference greater than twice the standard error  
being significant. Thus for instance, we get for the function

SLEEP

Now:

Arithmetical mean = 4.25  
Variance = 1.23

Formerly:

Arithmetical mean = 4.17  
Variance = 1.37

The variance being the average of the squares of the deviations of each item in  
relation to the arithmetical mean and expressed by the symbol  $S^2$ , the formula for  
the standard error of difference is then as follows:

$$\text{Standard error of difference} = \sqrt{S^2 + S'^2}.$$

The number of cases considered was 269. Thus in our example the difference between the two means is  $4.25 - 4.17 = 0.08$  giving a standard error of  $S.E. = \frac{123 + 117}{269} = 0.03$ .

Twice the standard error is then 0.06 which is smaller than the value of the difference, 0.08 which is thus significant. Therefore the difference appearing shows a change in respect of the "satisfiers" for the function "sleep".

The conclusions of this line of inquiry can be gathered from the following:

"TABLE OF DISPARITIES BETWEEN MEANS AND THEIR SIGNIFICANCE"

Function	NOW		FORMERLY		Twice standard error	Significance	
	Mean	Variance	Mean	Variance			
Sleep	4.25	1.23	4.17		0.08	0.06	significant
Eating	3.29	2.01	3.31		0.08	0.08	not significant
Evacuation	4.92	0.26	3.86		1.03	0.56	significant
Ablutions	4.82	1.32	3.36		1.46	0.64	significant
Cooking	4.79	0.49	3.62		0.97	0.52	significant
Laundry	2.13	0.20	2.11		0.02	0.03	not significant
Ironing	2.02	0.12	1.88		0.14	0.06	significant
"Lounging"	2.93	2.75	2.77		0.16	0.04	significant
Storage	3.52	2.02	3.17		0.35	0.03	significant

As regards the "sleep" function, while the variations in the "satisfiers" remain inconsiderable in themselves, they yield a higher level of satisfaction, owing largely to the orientation of the dwelling-houses which allows the cool winds frequent in Ciudad Sahagún to enter by doors and windows.

With respect to the "eating" function the difference between the means proves to be equal to twice the standard error, indicating that there has been no change in the conditions for the fulfilment of this function, the families of the workers moving to Ciudad Sahagún having in all cases brought with them the equipment they already had, while there has been no increase or improvement as regards the setting aside of a special room for meals.

For the "evacuation" function, a disparity was found of 1.03, the difference between the means, against 0.56, twice the standard error. The difference in the means is therefore significant and implies a definite improvement in the "satisfiers" for this function; in fact all houses are fitted with pedestal water-closets, which have supplanted other less sanitary and less convenient facilities.

The "ablutions" function also exhibits a significant difference between the means, which is greater than twice the standard error: a concomitant of the function's more adequate satisfaction has been an increase in the point rating in respect of material "satisfiers". All the houses provided for workers are fitted

with gas water-heaters supplying kitchens and bathrooms, so that personal ablutions can be performed more hygienically and conveniently than previously.

For the "cooking" function again, comparison of the two values reveals a significant difference indicative of better fulfilment of the function through the satisfiers supplied to workers in Ciudad Sahagún in the shape of kitchens with gas cookers, so that meals can be cooked conveniently and hygienically.

For the "laundry" function, the difference between the means is 0.02, the smallest value found for any function, twice the standard error being 0.3; as the latter is the greater, the difference is therefore without significance, and there has been no change in the provision for this function: home laundry in Ciudad Sahagún is done in small open concrete sheds with single-pitch sheet asbestos roofs carried on metal supports rising from a low wall; the washing is done in a sink and with cold water.

For the "ironing" function, a positive shift was disclosed, showing this function to be better catered for now than previously: while the lack of ironing-boards etc. and separate ironing rooms are negative factors, electric irons are commoner.

For the "lounging" function, there was a difference between the two means consequent on removal to Ciudad Sahagún which was indeed significant but not massive: the explanation is that only a few families have improved their situation as regards this function, while the majority simply brought along their existing chairs, suites and ornaments.

A significant difference is again found for the "storage" function, since most houses in Ciudad Sahagún have built-in fittings for storing clothing or household implements; in those houses without closets, wardrobes, chests of drawers and chests are used.

To sum up, it can be stated that, over all, the workers are achieving more satisfactory fulfilment of these functions than before, since significant plus differences were found between the present and former mean ratings in all cases, except for the eating and laundry functions where the increases noted were without significance.