INFLUENCE OF PUBLIC POLICIES IN THE DEVELOPMENT OF URBAN SERVICES IN AGUASCALIENTES, MEXICO

Rubén Macías Acosta, Julio César Macías Ponce and Lisandro José Alvarado-Peña

SUMMARY

The tasks of local governments must be addressed to promote human development in the entire population emphasizing inhabitants with fewer resources. The goal of this paper is to analyze the influence of public policies on the level of development of services for society in the municipalities of Aguascalientes, Mexico, so as to know the effectiveness of the government's work in covering the population, specifically considering piped water, sewer, and electricity. The methodology used was through the Gini index, used to calculate the human development index with services. The study population was constituted by the inhabitants of the municipalities of Aguascalientes, and the information was extracted from the State and Municipal System of Databases (SIMBAD) generated in INEGI (2019). The results show few increases in the well-being indicators referring to urban services. There is a deficiency in access, questioning the efficiency of public policies by generating inequality in municipalities and stagnation of social welfare.

Introduction

The responsibility of local governments is beyond the performance of their substantive tasks related to public collecting and spending because the division of social classes promotes inequality between individuals. According to Olvera et al. (2015) governments generate equity through public policies, and Krugman (2014) argues that inequity is established by government taxes and transfers. Governments are responsible for addressing this situation through the implementation of public policies aimed at increasing the well-being of the most unprotected population, which requires, without necessarily demanding it, government support in order to achieve a decent standard of living and enjoy the freedoms that allow them to develop properly in society; as indicated in Alcántara and Navarrete (2014), Mexico’s political constitution establishes human rights protected by the government.

Such inequality is a characteristic present in the stratified society that generates a differentiation between the dominant and dominated classes for the redistribution of wealth, and Olvera et al. (2015) argue that government intervention tries to modify reality and generate equality. Derived from the discussion presented in the ranking of unsatisfied needs, the government considers enterprises before the people on countless occasions, showing the prioritization of capitalist public policies, which feed the dilemma of the value of each of the priorities; according to Scott et al. (2001) government intervention establishes public policies to meet the objective of improving equality.

However, with an asymmetric distribution of people and goods in society, which is dominated in resources by capitalists and in numbers of people by the population in poverty, human development focused on the identification of the population in greater poverty is a more complicated task for the state, but it is its responsibility; as stated by Gutiérrez and Llamas (2016) government leadership is needed so that most of the population benefits. The well-being of the population is largely a responsibility of state governments because, through the public policies that they establish in their development plans, the benefit to a certain population sector is promoted, in which the most disadvantaged people must be the beneficiaries of support intended for them according to the normatives contained in the laws in Mexico, as well as in the public policies promised by politicians when campaigning; according to Gutiérrez and Llamas (2016) political campaign promises are unfulfilled upon reaching public office.

The commitments made by laws and campaigns are not always fully met. This situation generates a polarization of society because on many occasions resources are allocated to the richest, leaving aside the population in a situation of poverty and leading to a concentration of capital according to Marx’s approach that strengthens the class capitalists made up of big businessmen who have control of the means of production, dominating the working class and accumulating the wealth of society; Solow (2014) argues that the accumulation of capital establishes that the rich are richer. By neglecting support and evaluation of the working class by the state, it accentuates social inequality in which the rich have more resources and the poor can barely satisfy...
INFLUENCIA DAS POLÍTICAS PÚBLICAS NO DESENVOLVIMENTO DE SERVIÇOS URBANOS EM AGUASCALIENTES, MÉXICO
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RESUMO

As tarefas dos governos locais devem ser direcionadas para promover o desenvolvimento humano de toda a população, enfatizando a tarefa dos habitantes com menos recursos. O objetivo do documento é analisar a desigualdade no índice de desenvolvimento humano com serviços nos municípios de Aguascalientes, México, para conhecer a eficácia da atuação do governo na cobertura dos serviços no estado, considerando água encanada, drenagem, e energia elétrica. A hipótese considera a diminuição na desigualdade em um conjunto de itens que, por sua vez, definem uma categoria geral de bem-estar e implicam na diminuição da desigualdade. A metodologia utiliza o índice de Gini para verificar as dimensões calculadas em cada índice de desenvolvimento humano com serviços. A população do estudo foi habitantes das municipalidades de Aguascalientes e a informação foi coletada através do Sistema de Dados Estatístico Municipal (SIMBAD) gerado por INEGI (2019). Os resultados mostram pequenos aumentos e diminuições nos indicadores de bem-estar. Conclui-se que a estagnação da previdência social nos serviços e considerando sua redução no nível municipal.

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RESUMEN

Las tareas de los gobiernos locales deben encaminarse a promover el desarrollo humano en toda la población acentuándose la tarea en los habitantes con menores recursos. El objetivo del documento es analizar la desigualdad en el Índice de desarrollo humano con servicios en los municipios de Aguascalientes, México, para conocer la efectividad de la labor del gobierno en la cobertura de los servicios en el estado, considerando el agua entubada, el drenaje y la electricidad. La hipótesis considera la disminución en la desigualdad en un conjunto de rubros que a su vez definen un rubro general de bienestar implican la disminución de la desigualdad. La metodología utiliza el índice de Gini para comprobar las dimensiones calculadas en el índice de desarrollo humano con servicios. La población del estudio fueron habitantes de las municipalidades de Aguascalientes, y la información se obtuvo del Sistema de Bases de Datos Estatal y Municipal (SIMBAD) generado por INEGI (2019). Los resultados muestran escasos incrementos y decrementos en los indicadores de bienestar. Se concluye identificando el estancamiento del bienestar social en servicios y considerando la reducción de este a nivel municipal.
means of development and progress; therefore, its objective is to be oriented towards the creation of an adequate environment so that citizens can access a long, healthy and creative condition. It is complex to comply with, due to the prioritization of several immediate issues (PNUD, 2014). Therefore, the alternatives related to the capacities that people have been considered; according to Lasso and Urrutia (2001: 204) “the new approach when trying to measure capacities, that is, the set of options available to a person”.

Human development is a process that increases people’s well-being by promoting more alternatives. In this way, human development considers human capacities (a long and healthy life, education and a decent standard of living) and acquired capacities (social and political freedom) among the most important issues (PNUD, 2019). Returning to the conceptualization in PNUD (1997), human development shows community progress being a whole; therefore, it becomes a holistic definition (PNUD, 1998), considering people as the central axis in all aspects of the development process (PNUD, 2014).

The conception of societies from the principle of equality is established in segmental societies, which focus on kinship lacking specialization, where greater inequality is established derived from the economic model in which economic diversification establishes a social stratification. The periphery center that is established in the economic model proposed by Krugman (2014) generates an inequality for the periphery concerning around the center, the concentrator of all resources. In this situation there is symmetry, which raises inequality and equality in social environments, thus differentiating society from the modern situation.

The Gini Index and its Properties

Frequently, the need appears to measure the dispersion among the values of a variable. In economics, for example, various theories address the problem of income among the members of a group (country, state, society). The importance of dispersion measures in economics is justified if their interpretation is inequality. Thus, different indices for the measure of inequality can be found in the literature: Gini index, Theil index, Esteban, and Ray’s index.

Gini (1912) first introduced the index named after him. This is the most used index to measure the variations within a variable, in particular those related to the collection of resources associated with social welfare (income, for example). Considering that the income variable is intended to measure inequality, it is assumed that it takes continuous values and follows a Lorenz curve: This is represented in the unit interval, where 1 represents 100% of the population that ‘receives’ income. Let L: [0,1] → [0,1] be the cited function; that is, L(x) measures the proportion of wealth accumulated by x percent of the population. Graphically, Gini’s index is calculated as the quotient of two areas. If A is the cumulative area between the Lorenz curve and the square diagonal unit (the graph of the function f(x) = x) and B is the area under the Lorenz curve, then Gini’s index is calculated as

\[ G = \frac{A}{A + B} \]

Note that when the Lorenz curve resembles the identity curve (wealth is well distributed) the area of the curve approaches zero (there is no inequality); on the contrary, when the area approaches I the inequality is quite a lot. There are various formulations to calculate (or approximate) the Gini index. In particular, Sen (1973) proposed the following formulation that calculates the Gini’s index:

Let \( \mathbf{t} = (t_1, \ldots, t_m) \) be the vector where the components represent the respective income of the individuals belonging to a group in which we want to measure inequality (Sen, 1973). Note that income does not necessarily increase concerning the vector rows (it may happen that \( t_i > t_m \) for \( 1 < m \)). However, a vector \( \mathbf{t} = (t_1, \ldots, t_m) \) can be defined utilizing a permutation of the components of \( \mathbf{t} \). In such a way that \( t_i \leq t_m \) for \( 1 < m \). Then the Gini index is

\[ G(t) = \frac{1}{n(n + 1)} \left[ \sum_{i=1}^{n} t_i - \frac{2}{n(n + 1)} \sum_{i=1}^{n} (n + 1 - i)(t_i - t_{i+1}) \right] \]

Gini’s index has some properties of interest in the economics literature (see Plata et al., 2015, where there is a characterization of Gini’s index). Its properties are:

Scale independence

For any income vector \( \mathbf{t} \) and for any positive real number \( \lambda \), it is verified that \( G(\lambda \mathbf{t}) = G(\mathbf{t}) \).

An interpretation of this property would be to exchange the income currency (from pesos to dollars, for example) and the index (inequality) does not change. Joint monotonous separability

Let \( x, y \) be two vectors with real inputs. We take that \( x \) and \( y \) are jointly monotonous if \( (x_i - x_j, y_i - y_j) \geq 0 \) for all \( i, j \). The joint monotony can be interpreted as when comparing any two components of \( x \) and \( y \) (the same components in both vectors) it is verified that both components increase or both decrease or both are equal.

If \( x \) and \( y \) are jointly monotonous with non-negative inputs and such that \( \sum_{i=1}^{n} x_i = \sum_{i=1}^{n} y_i \), then \( G(\mathbf{x} + (1-\beta)\mathbf{y}) = \beta G(\mathbf{x}) + (1-\beta) G(\mathbf{y}) \) for all \( \beta \in [0,1] \). This property is called joint monotonic separability.

In a solution that has joint monotonic separability (such as Gini’s index) it is possible to have two allocations (two items) of resource, each one with its respective weighting and, the inequality can be calculated with the weighted total distribution, or inequalities can be calculated by item and then weight them.

Methodology

The present study follows a quantitative paradigm of an exploratory type, with a non-experimental design, taking into consideration the foundations laid by Tamayo y Tamayo (2011) and Hernández et al. (2014), since it is a study that seeks to examine issues that are not commonly addressed, without the deliberate manipulation of variables and in which the phenomena are only observed in their natural environment and then analyzed. In the same way, it can be said that the design used was bibliographic (Sabino, 2014) as for this type of study the selected data correspond to secondary sources, referring to reports or previous studies carried out by other researchers, prepared and processed in accordance with the objectives of the authors.

The study used information from the State and Municipal Database System (SIMBAD) generated in INEGI (2019). The statistical information presented in said database is disaggregated by state and their respective municipalities. The data contained comes from administrative records, national censuses, and derived statistics, in addition to including information from statistical yearbooks of the states and data from dependencies and organizations of the public, private and social sectors.

Specifically, information on the following variables was considered: a) Proportion of the population in private homes that have piped water, regardless of the frequency with which it is supplied. b) Proportion of the population in private homes that have some type of drainage, connected to the public network, septic tank, with a crack or gully drain, and to a river, lake or sea drain. c) Proportion of the population in private homes that have electricity.

With the aforementioned data the Gini index was applied, measuring the same dimensions as the human development index with the gross
domestic product (which is not available at the municipal level), substituting the quality of life given by income with the rate of inhabitants with drainage, the rate of inhabitants with water and the rate of inhabitants with electricity.

Results

Indicators of well-being in the public policies of Aguascalientes

This study was developed for the state of Aguascalientes, which has an area of 5,680,330 km². Aguascalientes represents 0.29% of the surface of Mexico (Figure 1). It borders in the North, East and West with the state of Zacatecas, and in the South and East with Jalisco. Aguascalientes is made up of eleven Municipalities, which are Aguascalientes (capital), Asientos, Calvillo, Cosío, Jesús María, Pabellón de Arteaga, Rincón de Romos, San José de Gracia, Tepezalá, San Francisco de los Romo and El Llano (GOBAGS, 2015).

The state has a population of 1,312,544 inhabitants, which represent 1.1% of the country's total. The population is concentrated as urban (81%) and the rest is rural. Regarding the education of its inhabitants, the average is 9.7 years. Economic activity in the state are represented by 4.08% in primary sector, 47.99% in secondary sector and 47.92% in tertiary sector. The economic activities of the manufacturing industry represent the largest contribution to the state gross domestic product, highlighting the production of machinery and equipment. Aguascalientes contributes 1.2% to the national GDP (GOBAGS, 2015).

Concerning the strategy of land use planning and urban development contained in the State Development Plan, the promotion of competitiveness in cities is considered so that an increase in the quality of life of citizens can be promoted. One of the tasks promoted by the government in Strategy 4.12. ‘Land use planning and urban development’ is access to quality urban services, it being a task that the government works continuously, because one of the government's goals is to achieve 100% coverage of drinking water, drainage and electrification to increase social welfare (Table I).

Related to the objectives to be achieved with these proposals, they have 100% achievement goals in relation to the coverage of the drinking water service, the drainage and the electrification services, which are basic services that manage to increase the well-being in people (Table II).

To complete the objectives, the lines of action set out in the State Development Plan are proposed considering actions that are aimed at achieving what is proposed in the aforementioned objectives, among which is the promotion of basic social infrastructure for the entire population, and whose goal is the promotion of human development for all the inhabitants of the entity (Table III).

An unanswered question is a hypothesis initially raised that expressed: Does the decrease in inequality in a set of items that in turn define a general category of well-being imply a decrease in inequality in the general category? In general, the implication regarding the previous question is not verified. Next, the well-being indicators are examined considering the service's ratings and the human development index (the inequality indices with respect to them) is integrated for the municipalities of the state of Aguascalientes in the years 2010 and 2015. Subsequently, the welfare indicators in the municipalities for the years 2010 and 2015 are presented, where the human development index of services is shown, composed of three rates: of piped water, drainage (I.DRE), electricity (I.ELEC) and human

<table>
<thead>
<tr>
<th>Current situation</th>
<th>Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the current state administration, the emphasis has been placed on promoting the organization of the territory, through the rational and sustainable distribution of the population, economic activities and services in the state's territory.</td>
<td>Promote an urban reform to promote competitive, sustainable, safe, livable, productive cities with quality of life, preventing the disorderly physical expansion of population centers, without sufficient, adequate and effective coverage of equipment, infrastructure and quality urban services.</td>
</tr>
</tbody>
</table>

Source: GOBAGS (2010).
with drainage, the rate of inhabitants with water and the rate of inhabitants with electricity. In the items presented there was an increase in well-being indicators that is close to zero in relation to the approach generated in the State Development Plan regarding quality urban services, indicating the need to implement effective lines of action in order to achieve the expected goals. In addition to observing a decrease in the value of piped water rate for some municipalities, presenting a dilemma regarding the decrease in well-being when an increase was being promoted, for which it is necessary to analyze the derived causes that generate a reduction in the quality of life and contradict the government's proposal. Specifically, in the municipality of Rincón de Romos, the piped water rate decreased in 2015, taking 2010 as a reference, a situation that may have been caused by an increase in population, since the urban areas of the localities grow without services.

### TABLE II
RATIONAL AND SUSTAINABLE DISTRIBUTION OF THE POPULATION, ECONOMIC ACTIVITIES AND SERVICES IN STATE TERRITORY

<table>
<thead>
<tr>
<th>Expected outcome in the coverage of</th>
<th>Indicator</th>
<th>Current status</th>
<th>2016 goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in potable water service</td>
<td>Percentage of private housing inhabited in localities with more than 500 inhabitants with potable water service</td>
<td>98.9%</td>
<td>100%</td>
</tr>
<tr>
<td>Increase in drainage service</td>
<td>Percentage of private housing inhabited in localities with more than 500 inhabitants with drainage service</td>
<td>98.1%</td>
<td>100%</td>
</tr>
<tr>
<td>Increase in electrification service</td>
<td>Percentage of private housing inhabited in localities with more than 500 inhabitants with electrification service</td>
<td>94.6%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: GOBAGS (2010).

### TABLE III
LINES OF ACTION

<table>
<thead>
<tr>
<th>Expected outcome in the coverage of</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.12.1.1 Promote urban reform that fosters competitive, sustainable, safe cities with quality of life</td>
</tr>
<tr>
<td>4.12.1.3 Address the challenges of the rural dispersion of the population and its demand for infrastructure, equipment and services</td>
</tr>
<tr>
<td>4.12.1.6 Increase the levels of development of the entire state territory</td>
</tr>
<tr>
<td>4.12.1.10 Consolidate urban neighborhoods and marginalized rural communities, providing them with basic social infrastructure services such as drinking water, sewerage, and electrification, placing special emphasis on municipalities with less coverage such as El Llano and San José de Gracia</td>
</tr>
</tbody>
</table>

Source: GOBAGS (2010).

### TABLE IV
WELL-BEING INDICATORS FOR 2010 AND 2015

<table>
<thead>
<tr>
<th></th>
<th>Rate of piped water (a)</th>
<th>Drainage rate (b)</th>
<th>Electricity rate (c)</th>
<th>Human development and services rate (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aguascalientes</td>
<td>0.991</td>
<td>0.992</td>
<td>0.988</td>
<td>0.994</td>
</tr>
<tr>
<td>Asientos</td>
<td>0.978</td>
<td>0.988</td>
<td>0.917</td>
<td>0.939</td>
</tr>
<tr>
<td>Calvillo</td>
<td>0.981</td>
<td>0.991</td>
<td>0.985</td>
<td>0.991</td>
</tr>
<tr>
<td>Cosío</td>
<td>0.995</td>
<td>0.993</td>
<td>0.968</td>
<td>0.98</td>
</tr>
<tr>
<td>Jesús María</td>
<td>0.983</td>
<td>0.992</td>
<td>0.981</td>
<td>0.991</td>
</tr>
<tr>
<td>Pabellón de Arteaga</td>
<td>0.984</td>
<td>0.991</td>
<td>0.979</td>
<td>0.987</td>
</tr>
<tr>
<td>Rincón de Romos</td>
<td>0.985</td>
<td>0.982</td>
<td>0.966</td>
<td>0.969</td>
</tr>
<tr>
<td>San José de Gracia</td>
<td>0.991</td>
<td>0.991</td>
<td>0.958</td>
<td>0.974</td>
</tr>
<tr>
<td>Tepezalá</td>
<td>0.98</td>
<td>0.976</td>
<td>0.912</td>
<td>0.939</td>
</tr>
<tr>
<td>El Llano</td>
<td>0.992</td>
<td>0.992</td>
<td>0.991</td>
<td>0.994</td>
</tr>
<tr>
<td>San Francisco de los Romo</td>
<td>0.991</td>
<td>0.992</td>
<td>0.988</td>
<td>0.994</td>
</tr>
</tbody>
</table>

Written with information from INEGI (2018).
Table V

<table>
<thead>
<tr>
<th>Rate of piped water (a)</th>
<th>Drainage rate (b)</th>
<th>Electricity rate (c)</th>
<th>Human development and services rate (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00387</td>
<td>0.01635</td>
<td>0.00439</td>
<td>0.00458</td>
</tr>
</tbody>
</table>


