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 develop-

ment index with services. The study population was constituted by the inhabitants of the municipalities of the state 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)

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 political the poor can barely satisfy

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Rubén Macías Acosta. Doctor in Government and Public Administration, Escuela Libre de Ciencias Políticas y Administración Pública, Mexico. Research Professor, Universidad Autonoma de Aguascalientes, Mexico. ORCID: https://orcid.org/00000003-4097-745X. e-mail: ruben. macias@edu.uaa.mx

Julio César Macías Ponce. Doctor of Science in Applied Mathematics, Centro de Investigación en Matemáticas, Mexico. Research Professor, Universidad Autonoma de Aguascalientes, Mexico. ORCID: https://orcid.org/0000-0001-5141-7074. e-mail: jlmacias@correo.

Lisandro José Alvarado-Peña (Corresponding author). Doctor in Social Sciences. Research Professor, Professional School of Managment, Universidad Señor de Sipán (USS) - Campus Pimentel, Lambayeque-Perú. ORCID: https://orcid.org/0000-0001-5097-811X. e-mail: lisandroinvestigacion@gmail.com

INFLUENCIA DE LAS POLÍTICAS PÚBLICAS EN EL DESARROLLO DE SERVICIOS URBANOS EN AGUASCALIENTES, MÉXICO

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

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.

INFLUÊNCIA DAS POLÍTICAS PÚBLICAS NO DESENVOLVIMENTO DE SERVIÇOS URBANOS EM AGUASCALIENTES, MÉXICO

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

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 da 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 no índice de desenvolvimento humano com serviços. A população do estudo foram habitantes das municipalidades de Aguascalientes e a informação obteve-se do Sistema de Bases de Dados Estatal e Municipal (SIMBAD) gerado por o INEGI (2019). Os resultados mostram pequenos aumentos e diminuições nos indicadores de bem-estar. Conclui identificando a estagnação da previdência social nos serviços e considerando sua redução no nível municipal.

their basic needs; in accordance with Piketty (2014) a large number of people have subsistencial level income.

The objective of this research is to analyze the influence of public policies on the level of development of social services in the municipalities of Aguascalientes, México. The hypothesis that arises in this research considers the decrease in inequality in a set of items that, in turn, define a general area of the well-being of society and therefore imply the reduction of inequality in social services.

Inequality in Human Development as an Element of Public Policy

Public policies must be oriented towards promoting social welfare through the actions that the government carries out in and for society. Therefore, the state has a great commitment to the achievement of projects that allow improving the standard of living of citizens by allocating the resources collected through taxes in programs designed to benefit the most unprotected people in the social fabric. Therefore, according to Castelao (2016) public policy requires directing its efforts to prioritize the needs of citizens, being able to integrate the economic function and the social function, becoming a mechanism that favors economic progress and social transformation in interaction with the state and the market.

Therefore, the government's responsibility to carry out orderly actions in which support reaches the needlest people must be audited to achieve positive effects on citizens; the evaluation of public policies is

important because it is necessary to know the results of government plans and programs, allowing them to continue or reorient their course of action. Also, such evaluation will allow avoiding inappropriate results when using public resources; the evaluation confirms value, importance, improvement of the evaluated aspect, accreditation, accountability, accountability, accountability (Stufflebeam and Coryn, 2014).

The Inter-American Development Bank (IDB, 2012) high-lights the interest of citizens in achieving public welfare objectives through the establishment of public programs that allow them to benefit, which should be considered in public policies for their execution (Winchester, 2011). In this sense, the benefits of the evaluation of public policies are shown with the systemic analysis of alternative

policies, generating valuable information for public officials; this is done to support social representatives to develop relevant public policies and social programs (Winchester, 2011).

Through the evaluation and monitoring of public policies and programs, information is shown on the work of the government or of ministries or public agencies, of their managers and officials. The results are important, so that donors who support the work of the government know their performance (Mackay, 2007). Evaluation supports decision-making and increases the effectiveness and efficiency of rural public policy, as stated by the Interagency Group for Rural Development (GIDR,

The definition of human development is integrated on the basis of goals and not of

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: $[0,1] \rightarrow [0,1]$ 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 Lorentz 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

$$A/(A+B)$$

Note that when the Lorentz 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 1 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 $t = (t_1, ..., t_n)$ 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 $t_l > t_m$ where l < m). However, a vector $t^* = (t_1, \dots, t_{m^*})$ can be defined utilizing a permutation of the components of t. In such a way that $t_l \le t_m$ for l < m. Then then the Gini index is

$$G(t) = \frac{1}{n} \Bigg[n + 1 - 2 \Bigg(\frac{\sum_{i=1}^{n} (n+1-i)t_{i}^{*}}{\sum_{i=1}^{n} t_{i}^{*}} \Bigg) \Bigg]$$

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 t and for any positive real number λ it is verified that $G(\lambda t) = G(t)$.

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
$$\mathbf{x} \begin{pmatrix} \mathbf{x_1} \\ \vdots \\ \mathbf{x_n} \end{pmatrix}$$
 and $\mathbf{y} = \begin{pmatrix} \mathbf{y_1} \\ \vdots \\ \mathbf{y_n} \end{pmatrix}$ 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 $G[\beta x + (1-\beta)y] = \beta G(x) + (1-\beta)$ G(y) for all as $\beta[0,1]$. 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 5,680,330km². 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



Figure 1. Mexico's map (Aguascalientes). Source: INEGI (2021)).

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, and electricity.

Table IV shows the data used to calculate the indices for piped water (I.AGE), drainage (I.DRE), electricity (I.ELEC) and human

TABLE I LAND USE PLANNING AND URBAN DEVELOPMENT

Current situation	
he current state administration, the emphasis	Promote an urba
s been placed on promoting the organization of	sustainable, sat

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.

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.

Proposal

Source: GOBAGS (2010).

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

Expected outcome in the coverage of	Indicator	Current status	2016 goal
Increase in potable water service	Percentage of private housing inhabited in lo- calities with more than 500 inhabitants with potable water service	98.9%	100%
Increase in drainage service	Percentage of private housing inhabited in lo- calities with more than 500 inhabitants with drainage service	98.1%	100%
Increase in electrification service	Percentage of private housing inhabited in lo- calities with more than 500 inhabitants with electrification service	94.6%	100%

Source: GOBAGS (2010).

TABLE III LINES OF ACTION

Expected outcome in the coverage of

- 4.12.1.1 Promote urban reform that fosters competitive, sustainable, safe cities with quality of life
- 4.12.1.3 Address the challenges of the rural dispersion of the population and its demand for infrastructure, equipment and services
- 4.12.1.6 Increase the levels of development of the entire state territory
- 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

Source: GOBAGS (2010).

development with services (I.DHUM). This last index measures the same dimensions as the human development index with the gross domestic product (which is not available at the municipal level); therefore, the part of quality of life given by income is replaced with the rate of inhabitants 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

TABLE IV WELL-BEING INDICATORS FOR 2010 AND 2015

	Rate of piped water (a)		Drainage rate (b)		Electricity rate (c)		Human development and services rate (d)	
	2010	2015	2010	2015	2010	2015	2010	2015
Aguascalientes	0.991	0.992	0.988	0.994	0.996	0.998	0.899	0.91
Aguascalientes	0.978	0.988	0.917	0.939	0.977	0.989	0.884	0.89
Asientos	0.981	0.991	0.985	0.991	0.991	0.996	0.901	0.906
Calvillo	0.995	0.993	0.968	0.98	0.979	0.991	0.889	0.899
Cosío	0.983	0.992	0.981	0.991	0.987	0.996	0.898	0.911
Jesús María	0.984	0.991	0.979	0.987	0.989	0.995	0.897	0.907
Pabellón de Arteaga	0.985	0.982	0.966	0.969	0.99	0.993	0.886	0.901
Rincón de Romos	0.971	0.988	0.915	0.95	0.98	0.987	0.898	0.895
San José de Gracia	0.991	0.991	0.958	0.974	0.986	0.994	0.895	0.916
Tepezalá	0.98	0.976	0.912	0.939	0.969	0.98	0.88	0.895
El Llano	0.992	0.992	0.991	0.994	0.994	0.996	0.904	0.903
San Francisco de los Romo	0.991	0.992	0.988	0.994	0.996	0.998	0.899	0.91

Written with information from INEGI (2018).

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.

The Gini Index vs the Human Development Index with services

Table V shows the calculated inequality indices and, although differences are small among municipalities, it can be seen that both in 2010 and 2015 inequality is higher in the drainage area. In addition, inequality in piped water, electricity and drainage all decreased in 2015 compared to 2010, but paradoxically the human development index indicates that inequality is slightly higher in 2015 compared to 2010

The Gini index, as shown in Table V, had a contraction in 2010 compared to 2015 in all the calculated items, decreasing by 0.01248 in piped water, 0.00019 in electricity, 0.00904 in drainage and 0.00211 in the human development index with services, revealing a greater lag in services in the municipalities.

This situation should be the opposite, since over time there is an increase in the well-being of the inhabitants with the increase in the coverage of services; however, the result is opposite, it being necessary to analyze the utilization of the resources allocated to the creation of an infrastructure in these services.

Conclusions

It is necessary to conclude the present study with four main dilemmas, the first being the deficiency in the access to quality urban services in Aguascalientes, specifically in those considered in the human development index with

TABLE V GINI INDEX OF 2010 AND 2015

	Rate of piped water (a)		Drainage rate (b)		Electricity rate (c)		Human development and services rate (d)	
	2010	2015	2010	2015	2010	2015	2010	2015
Gini's value	0.00387	0.01635	0.00439	0.00458	0.00242	0.01146	0.00264	0.00475

services, since they are those that cover the basic needs of the population. They are highly important, since piped water is essential to avoid diseases derived from the lack of cleaning, drainage is necessary to prevent waste from generating unsanitary conditions and electricity is required to increase the connectivity and conservation of refrigerated food, among other uses.

The situation is worrisome because inequality increased in 2015 compared to 2010, and the analyzed services are basic for reducing poverty in people with fewer resources. With this situation, inequality increases due to the fact that the vulnerable groups can remain the same and increase the inequality in other groups. The situation is multifactorial and one of its possible causes is the growth of the urban area. However, this situation generates a distancing of the government from the sustainable development goals, specifically of '5-Clean water and sanitation', '7-Affordable and non-pollutenergy' '10-Reduction of inequalities', leaving in question the effectiveness in the rational and sustainable distribution of the population, economic activities and services in the state territory, as well as its lines of action as defined in the State Development Plan.

The second dilemma refers to the questioning of the effectiveness of public policies in Aguascalientes, which are generating inequality in the state municipalities. However, it is necessary to analyze the opposite causes generating effects that are different from those raised in public policies, because it can be found that public money is used in other actions for partisan purposes that divert the resources destined to the population for political campaigns or, also, the use of the resources for other indices that generate an increase in a service that is considered as being more relevant. It is important for the municipality, however, to assess the priorities of the population in relation to well-being, so as to generate support for one type of infrastructure instead of another, because people perceive a different degree of satisfaction according to their needs and priorities.

Thirdly, the need to analyze the use of resources in the infrastructure of access to quality urban services has to be considered, since costs may be too high and people with greater resources may benefit due to favoritism or pressure by power groups. In addition, it is necessary to analyze the areas where the beneficiaries of the resources are located, as well as to check if the resources were destined to the most marginalized sectors or to another sector with greater privileges.

Finally, in the present work a counterexample reveals the phenomenon that a decrease in inequality in different welfare categories does not necessarily reduce inequality in a general category, defined in terms of individual categories. Note that the present study does not contradict the joint monotonous separability property the items do not verify the equality $\sum_{i=1}^{n} x_i = \sum_{i=1}^{n} y_i$.

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