

GOVERNO DO ESTADO DO CEARÁ  
SECRETARIA DO PLANEJAMENTO E COORDENAÇÃO (SEPLAN)  
Instituto de Pesquisa e Estratégia Econômica do Ceará (IPECE)

## TEXTO PARA DISCUSSÃO Nº 23

### USING STATISTICS TO IMPLEMENT A SOCIAL INCLUSION POLICY: THE CASE OF CEARA

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Textos para Discussão do Instituto de Pesquisa e Estratégia Econômica do Ceará (IPECE)

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A Série Textos para Discussão do Instituto de Pesquisa e Estratégia Econômica do Ceará (IPECE), tem como objetivo a divulgação de trabalhos elaborados pelos servidores do órgão, que possam contribuir para a discussão de diversos temas de interesse do Estado do Ceará.

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## SUMÁRIO

1	INTRODUCTION	5
2	DEFINING SOCIAL INCLUSION	6
3	MENSURING SOCIAL INCLUSION	7
	3.1 The Social Development Index (SDI)	7
	3.2 The relation between the SDI-R and the SDI-O	10
	3.3 The Social Performance Index (SPI)	12
	3.4 The SDI* - An index to measure the distance to an ideal situation	13
4	A SOCIAL INCLUSION RULE	14
5	SOME RESULTS	14
	5.1 SDI-R behavior	14
	5.2 SDI-O behavior	16
	5.3 The interaction between the SDI-R and the SDI-O	17
	5.4 The performance of social indicators	19
	5.5 The behavior of the SDI*	23
6	MONITORING THE MDGs IN CEARA	24
7	CONCLUDING REMARKS	27
	REFERENCES	28



## 1. INTRODUCTION

The promotion of social inclusion is nowadays the main policy goal for the majority of developing economies. Brazil and its states, in general, and the State of Ceara, in particular, also share the same objective, which emerges from the increasing awareness of the causes and consequences of social exclusion, that has favored the achievement of a consensus that public policies should be focused on results, i.e., on the improvement of society's well-being.

Perhaps, the most illustrative example of the importance and representativeness of social inclusion and exclusion concepts was the Millennium Declaration that was signed in September 8, 2000, during the UN Millennium Summit, by 147 Heads of State and government, and then adopted by 189 nations worldwide. These nations have committed to achieve a set of eight time-bound targets, called The Millennium Development Goals (MDGs), by 2015. They are the following:

- 1- Eradicate extreme poverty and hunger;
- 2- Achieve universal primary education;
- 3- Promote gender equality and empower women;
- 4- Reduce child mortality;
- 5- Improve maternal health;
- 6- Combat HIV/AIDS, malaria and other diseases;
- 7- Ensure environmental sustainability; and
- 8- Global partnership for development.

Inspired by the MDGs, but in a less ambitious way, more compatible to its available resources and acknowledging the most important needs of the population, the Government of the State of Ceara, Brazil, defined the following general goals for its social policies:

- 1- Improve the access and the quality of education;
- 2- Increase the coverage and the quality of health services;
- 3- Enhance infrastructure services;

4- Promote job opportunities as a means to fight poverty; and

5- Improve living conditions of the rural population.

In order to achieve these goals, the State Government developed a Social Inclusion System (SIS), considering that, if in a theoretical perspective it is relatively simple to choose social inclusion as a priority, the same does not occur when one tries to make this concept operational.

Thus, conscious of this important distinction, SIS was developed in three phases:

- Firstly, the concept of social inclusion was objectively defined so it could be measured.
- Secondly, indicators were chosen to quantify the current level of inclusion and its evolution, in terms of time and space.
- Thirdly, the State's Government aiming to promote social development in Ceara implemented incentive and commitment policies.

This paper presents the methodology and some results obtained since the implementation of the referred system, in 2003, describing Ceara's experience and presenting a series of concepts, indicators, and strategies that the Government is using to promote social inclusion.

## **2. DEFINING SOCIAL INCLUSION**

The concept of social inclusion is related to the necessity to regain the basic rights of those who are considered "disadvantaged" or "excluded". This concept is, therefore, related to a broad range of factors and, as a consequence, governments face the challenge to design and implement effective policies aiming to enhance it.

In operational terms, due to the multitude of aspects involved, it is difficult to measure social inclusion in order to obtain relevant information to guide governments' actions. An approach to face this problem is to limit the aspects analyzed to key dimensions related to the concept. In this perspective, the

Government of Ceara defined social inclusion considering five specific dimensions: education, health, living conditions, employment and income, and rural development.

### **3. MEASURING SOCIAL INCLUSION**

A notion strongly rooted in the present analysis is that measuring social inclusion constitutes one of the main instruments available to public managers in order to rationalize the use of resources and to consistently plan public actions. Hence, social inclusion measures become important tools to avoid unwanted outcomes as they allow for periodical evaluations, aiming to fulfill Government's commitments to society.

Social inclusion is being measured in Ceara through indicators characterized by their simplicity, straightforward meaning, regularity, availability, and recognition by the specialized literature. More specifically, social inclusion has been measured by synthetic indices that try to incorporate indicators from the dimensions mentioned before.

#### **3.1 The Social Development Index (SDI)**

The first index proposed to measure social inclusion in Ceara was the Social Development Index (SDI). An important characteristic of this index, that makes it different from most social indices developed in the literature, is that it is divided into two policy dimensions. More specifically, SDI has an outcome dimension that aims to identify the final goals that are intended to be reached in terms of inclusion, and an output dimension, that is related to the means available to the Government to achieve the desired results. This distinction is relevant because, despite the fact that results are the priority, the Government can only directly control the output of public services.

Thus, social inclusion is measured by the Social Development Index of Results (SDI-R) – that reflects the results achieved by each municipality, and by the the Social Development Index of Output (SDI-O) – that measures the public social output of the

State.

The following indicators compose SDI:

**FIGURE 1**  
**SDI Indicators – Outcomes and Outputs**

<b>OUTCOMES</b>	<b>OUTPUTS</b>
<p><b>a) Education:</b></p> <ul style="list-style-type: none"> <li>. Primary education schooling rate</li> <li>. Secondary education schooling rate</li> <li>. 4<sup>th</sup> grade promotion rate.</li> </ul>	<p><b>a) Education:</b></p> <ul style="list-style-type: none"> <li>. Proportion of teachers in primary education with bachelor degrees</li> <li>. Proportion of teachers in secondary education with bachelor degrees</li> <li>. Libraries, reading rooms and computer labs per public school; and</li> <li>. Computer equipments per public school.</li> </ul>
<p><b>b) Health:</b></p> <ul style="list-style-type: none"> <li>. Infant mortality rate</li> <li>. Cerebral Vascular Accident (CVA) admittance rate</li> </ul>	<p><b>b) Health:</b></p> <ul style="list-style-type: none"> <li>. Prop. of women assisted during the first 3 months of pregnancy</li> <li>. Proportion of children (2 years old or younger) assisted</li> <li>. Proportion of the population assisted by the <i>Family Health Program</i></li> </ul>
<p><b>c) Living Conditions:</b></p> <ul style="list-style-type: none"> <li>. Proportion of urban domiciles with regular water supply</li> <li>. Proportion of urban domiciles with sewage</li> </ul>	<p><b>c) Living conditions:</b></p> <ul style="list-style-type: none"> <li>. Urban water supply coverage rate</li> <li>. Urban sewage coverage rate</li> </ul>
<p><b>d) Employment and income:</b></p> <ul style="list-style-type: none"> <li>. Average residential energy consumption</li> <li>. Formal employment quality index</li> <li>. Average establishments' size</li> </ul>	<p><b>d) Employment and income:</b></p> <ul style="list-style-type: none"> <li>. Secondary enrollment – total enrollment ratio</li> <li>. Health professionals per 1,000 inhabitants</li> <li>. Paved roads – municipality area ratio.</li> </ul>
<p><b>e) Rural Development:</b></p> <ul style="list-style-type: none"> <li>. Gross value of the agricultural production per rural establishment</li> <li>. Proportion of energy consumption in rural areas</li> </ul>	<p><b>e) Rural development:</b></p> <ul style="list-style-type: none"> <li>. Mean value of rural loans</li> <li>. Assisted producers per rural establishment</li> </ul>

The method used to compute both the SDI-R and the SDI-O for all municipalities in Ceara consists in normalizing the selected indicators so that they would be constrained to the [0,1] interval. More specifically, 0 represents the worst case while 1 represents the best. Hence, a normalized indicator "I" of municipality "i" ( $I_{ni}$ ) is obtained as follows:

$$I_{ni} = \frac{I_i - I_W}{I_B - I_W},$$

where:

$I_i$  = Indicator's value for municipality "i";

$I_B$  = Indicator's best value; and

$I_W$  = Indicator's worst value.

Then, in order to compute the SDI (of outcomes or outputs) for each municipality in each dimension, the following procedure is used:



$$SDI_{ij} = \frac{\mu_{ij}}{1 + (\sigma_{ij}/2)},$$

where:

$SDI_{ij}$  = Social Development Index of the  $i^{\text{th}}$  municipality in the  $j^{\text{th}}$  dimension;

$\mu_{ij}$  = Mean of the normalized indicators of the  $i^{\text{th}}$  municipality in the  $j^{\text{th}}$  dimension; and

$\sigma_{ij}$  = Standard deviation of the normalized indicators of the  $i^{\text{th}}$  municipality in the  $j^{\text{th}}$  dimension.

The dimension indices' means are divided by the factor  $1 + (\sigma_{ij}/2)$ , because then it would be possible to penalize those municipalities whose indicators of a specific dimension are very heterogeneous (specifically when one of them is much better than the others).

For the calculation of the general SDI (of results or output) for each municipality, a weighted average of the dimension indices is considered as follows:

$$SDI = 0.225 \times (SDI_{EDU} + SDI_{HTH} + SDI_{LCS} + SDI_{EIN}) + 0.1 \times SDI_{RDT}$$

where EDU represents Education, HTH represents Health, LCS represents Living Conditions, EIN represents Employment and Income, and RDT represents Rural Development.

It is straightforward to notice from the formula above that it was given a smaller weight to the rural development dimension (10% instead of 22.5%). This was done for two reasons. First, one should notice that the performance of the agricultural sector in Ceara still depends heavily on the rain season. Hence, in a year with regular rainfall, the dimension's performance tends to be good. Additionally, at the municipal level, the adoption of this differentiated weight was done as an attempt not to skew the results towards the municipalities that have comparative advantages in agricultural activities.

In both situations, municipalities are grouped into four categories according to their SDI's (of outcomes or outputs) and, then they receive a concept (or a color) in accordance to their value. Each municipality can be characterized in terms of social

development in comparison to the others as bad (red), regular (yellow), good (green) or great (blue). More specifically, municipalities are grouped as follows:

- $0.000 \leq \text{SDI} < 0.300 \Rightarrow$  bad
- $0.300 \leq \text{SDI} < 0.500 \Rightarrow$  regular
- $0.500 \leq \text{SDI} < 0.700 \Rightarrow$  good
- $0.700 \leq \text{SDI} \leq 1.000 \Rightarrow$  great

Therefore, these categories allow the classification of the municipalities into groups in accordance to their levels of social development as an attempt to select those that present similar overall characteristics.

### 3.2 The relation between the SDI-R and the SDI-O

Based on the definitions presented, it is reasonable to suppose that there is an intersection amongst the municipalities that present the best (worst) output conditions and those that present the best (worst) results. This relation between the SDI-R and the SDI-O is expected since better output conditions, in general, potentially allow a municipality to yield better results.

The existing social problems in Ceara are due to a series of causes, but, specifically to an insufficient output of public services. And, these problems will bring repercussions to the results obtained as inexpressive result indicators are measured. Thus, the improvement in public services output would help to fight the causes of the existing problems, inducing the achievement of better results over time. And, the social services provision strategy should be done based on the existing output and results.

Hence, estimating a relation between the SDI-O and the SDI-R will be fundamental to the definition of more effective public policies, i.e., policies that are capable of affecting more intensively their target population in a way that the existing social conditions would improve significantly over time.

A way to estimate the level of association between these variables is through the following econometric model:

$$SDI - R_i = B_1 + B_2 \cdot SDI - O_i + B_3 \cdot DIST_i + B_4 \cdot DENS_i + B_5 \cdot DENS_i^2 + u_i, \quad (1)$$

where:

SDI-R<sub>i</sub> = SDI-R of the i<sup>th</sup> municipality;

SDI-O<sub>i</sub> = SDI-O of the i<sup>th</sup> municipality;

DIST<sub>i</sub> = Distance from the i<sup>th</sup> municipality to Fortaleza (in Km);

DENS<sub>i</sub> = Demographic density of the i<sup>th</sup> municipality (inhabitants per sq. Km);

B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>4</sub>, B<sub>5</sub> = Parameters;

u<sub>i</sub> = Random disturbance.

This model assumes that there exists a positive relation between output and outcomes, i.e., it is expected that the estimate of the parameter B<sub>2</sub> is positive. And, based on this estimate, it will be possible to evaluate the change in the SDI-R according to the change in the SDI-O.

More specifically, this model is linear and, therefore, a certain increase in the output tends to generate approximately the same effect (in absolute terms) in the municipalities' results. On the other hand, one should realize that, in relative terms, the impact of an increase in output tends to be greater in those municipalities with smaller SDI-R's. A formal way to measure this differentiated effect is the following:

$$\Delta\%(SDI - R_i) \approx \frac{B_2 \times \Delta(SDI - O_i)}{SDI - R_i} \times 100\% \quad (2)$$

Hence, one could realize that the greater the SDI-R is, the smaller the impacts will be (in relative terms).

It is also possible to notice that two other variables were included as controls in the model. The distance to Fortaleza (the State's capital) was included as an attempt to verify if the municipalities located closer to the capital tend to present better results than those that are farther away (given their existing outputs of public social services). Additionally, it is possible to identify if each municipality has the ability to benefit from their own infrastructure and services according to their demographic densities. Implicitly, it is assumed that where density is small it is more difficult to concentrate differentiated services. However, as it starts to rise, one should expect better outcomes since agglomeration economies will be present. However, that

these agglomeration economies do not grow linearly. Then, it seems reasonable to consider that there could be a situation where the costs of concentration may surpass the benefits generated, characterizing the so-called “diseconomies of agglomeration”.

### 3.3 The Social Performance Index (SPI)

An additional analysis would be to verify if Ceara and its municipalities are evolving in terms of social inclusion. In this case, the SDI-R would not be suitable since its main goal is to rank the municipalities according to their levels of social development. Then, a high SDI-R would not guarantee *per se* that a municipality has desirable social conditions. In accordance to the methodology used, it only shows if a municipality has a greater overall level of social development compared to the others.

Hence, in this context, the **Social Performance Index (SPI)** is proposed. This is an index that will measure the change in social conditions over time and, therefore, it will show if the State and its municipalities are advancing in terms of social inclusion.

SPI indicators are, in fact, percentage changes of the indicators that were used to calculate SDI, and it also has two policy dimensions, outcomes (R) and outputs (O). More specifically, for the  $j^{\text{th}}$  dimension, for both outcomes and outputs, it could be calculated as follows:

$$SPI_j = \frac{\sum_{i=1}^{n_j} (\Delta\%I_{ij}) / n_j}{1 + (\sigma_j / 2)},$$

where:

$\Delta\%I_{ij}$  = Percentage change of the  $i^{\text{th}}$  indicator in the  $j^{\text{th}}$  dimension;

$n_j$  = number of indicators in the  $j^{\text{th}}$  dimension; and

$\sigma_j$  = Standard deviation of the percentage change of the indicators of the  $j^{\text{th}}$  dimension.

The calculation of the general SPI-R for the State and its municipalities will be done as follows:

$$SPI - R = 0.225 \times (SPI_{EDU} - SPI_{HTH} + SPI_{LCS} + SPI_{EIN}) + 0.1 \times IPS_{RDS}$$

where *EDU* represents *Education*, *HTH* represents *Health*, *LCS* represents *Living Conditions*, *EIN* represents *Employment and Income*, and *RDT* represents *Rural Development*.

It is worth mentioning that, when outcomes are considered, in the health dimension, its index should be multiplied by -1 because, when its indicators grow, this would imply that conditions will be worsening, which is exactly the opposite of what happens in the other dimensions. Proceeding as such, all indicators of the SPI-R can be interpreted in the same manner (the larger, the better).

On the other hand, when outputs are considered, the calculation of the general SPI-O for the State and its municipalities will be done as follows:

$$SPI - O = 0.225 \times (SPI_{EDU} + SPI_{HTH} + SPI_{LCS} + SPI_{EIN}) + 0.1 \times IPS_{RDS}$$

Furthermore, one can notice that it was assigned a smaller weight to the rural development dimension (10% instead of 22.5%). The same adjustment was done before, in section 3.1, when SDI was defined.

### 3.4 The SDI\* - An index to measure the distance to an ideal situation

Another analysis that can be done is related to the comparison between the current and an ideal situation in terms of social inclusion. Therefore, it is necessary to develop another index, the **SDI\***.

The indicators that will compose this index are exactly the same that were used to calculate the SDI-R and the desired situation is defined in accordance with specific criteria defined for each case (these criteria will be detailed in section 5.5). Formally:

$$SDI^* = \frac{1}{n} \cdot \sum_{i=1}^n \frac{I_i}{I_i^*} \times 100\% \text{ } ^6,$$

where:

n = Number of indicators considered;

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<sup>6</sup> In the case of health indicators, that are better when their values are smaller, it was used the ratio I\*/I in the calculations of the SDI\*.

$I_i$  = Current value of the  $i^{\text{th}}$  indicator; and

$I_i^*$  = Desired value of the  $i^{\text{th}}$  indicator.

Thus, the SDI\* is the average of the ratios between current and desired values of the indicators, showing how close the State is to achieve those conditions. Furthermore, this is another way to verify if the State is progressing in terms of social inclusion.

#### 4. A SOCIAL INCLUSION RULE

The Social Inclusion System allows that mechanisms for the definition of goals and for the measurement of results are established, aiming to monitor the various programs and to identify the reasons for the success or failure in achieving the proposed goals.

Inspired by the main objective of the Governmental Plan, which is "Growth with Social Inclusion", a social inclusion rule can be defined as follows:

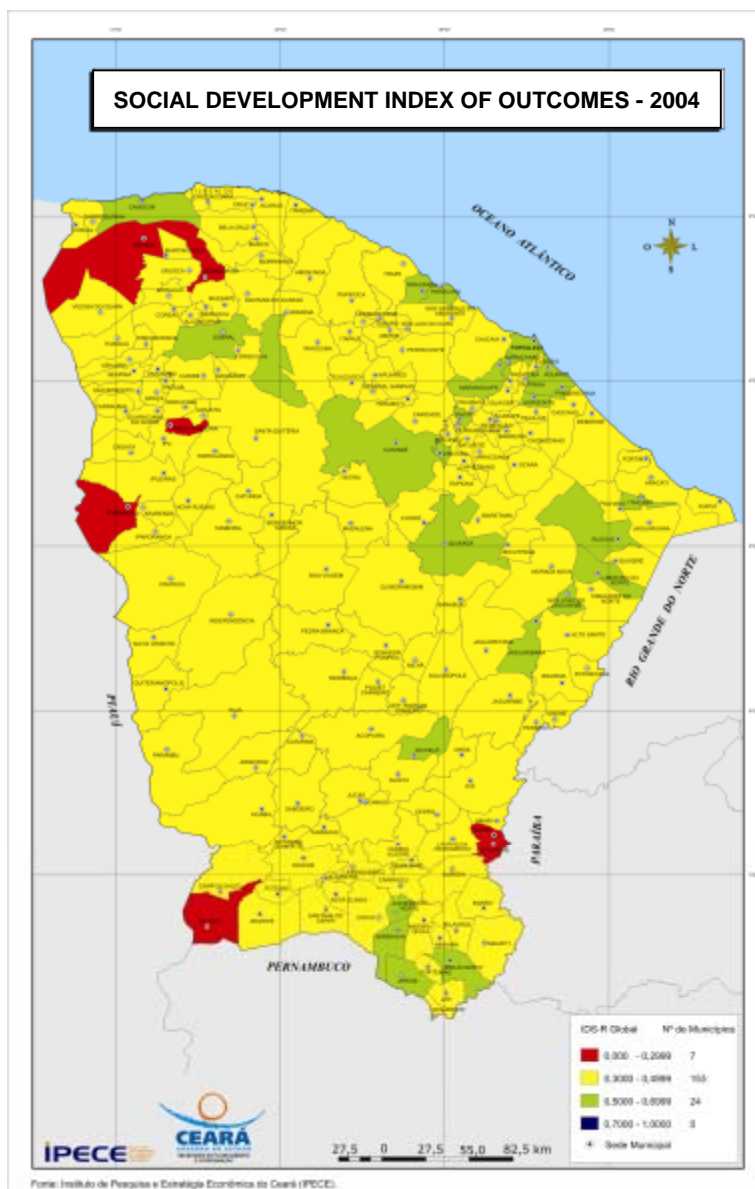
$$\text{SPI-R} \geq \Delta\% \text{ Per Capita GDP}$$

Hence, it is expected that, every year, social inclusion will advance more intensively than the State's per capita Gross Domestic Product (GDP), i.e., it is expected that social performance always outgrows the economic performance.

#### 5. SOME RESULTS

##### 5.1 SDI-R behavior

SDI-R calculations for the years 2002, 2003, and 2004 allow the analysis of how the regional distribution of social inclusion is behaving in Ceara. In order to illustrate the distribution of Ceara's municipalities according to their values of the SDI-R, a map is presented ahead.



One way to summarize these results during the period 2002-2004 is through Table 1, below.

**TABLE 1**  
**Number of municipalities according to their relative concepts**  
**Outcomes – 2002-2004**

Concept	Year		
	2002	2003	2004
Great	0	0	0
Good	18	20	24
Regular	163	161	153
Bad	3	3	7

Source: IPECE.

This analysis shows that, in general, the majority of Ceara's municipalities can be characterized in terms of social inclusion as "regular", indicating that their overall social conditions are somewhat similar. Just a few of them presented better or worse conditions. Furthermore, the regional distribution of social development remained practically unchanged, even though it was possible to verify some changes in the ranking of municipalities, with some of them approaching the ones with the best conditions and others approaching the ones with the worst conditions.

## 5.2 SDI-O behavior

It is possible to verify that the majority of Ceara's municipalities can be characterized in terms of social outputs as "regular" during the period, indicating that their overall output conditions are somewhat similar. Just a few of them presented better or worse conditions. The distribution of Ceara's municipalities according to their values of the SDI-O, in 2004, can be illustrated by a map presented below.

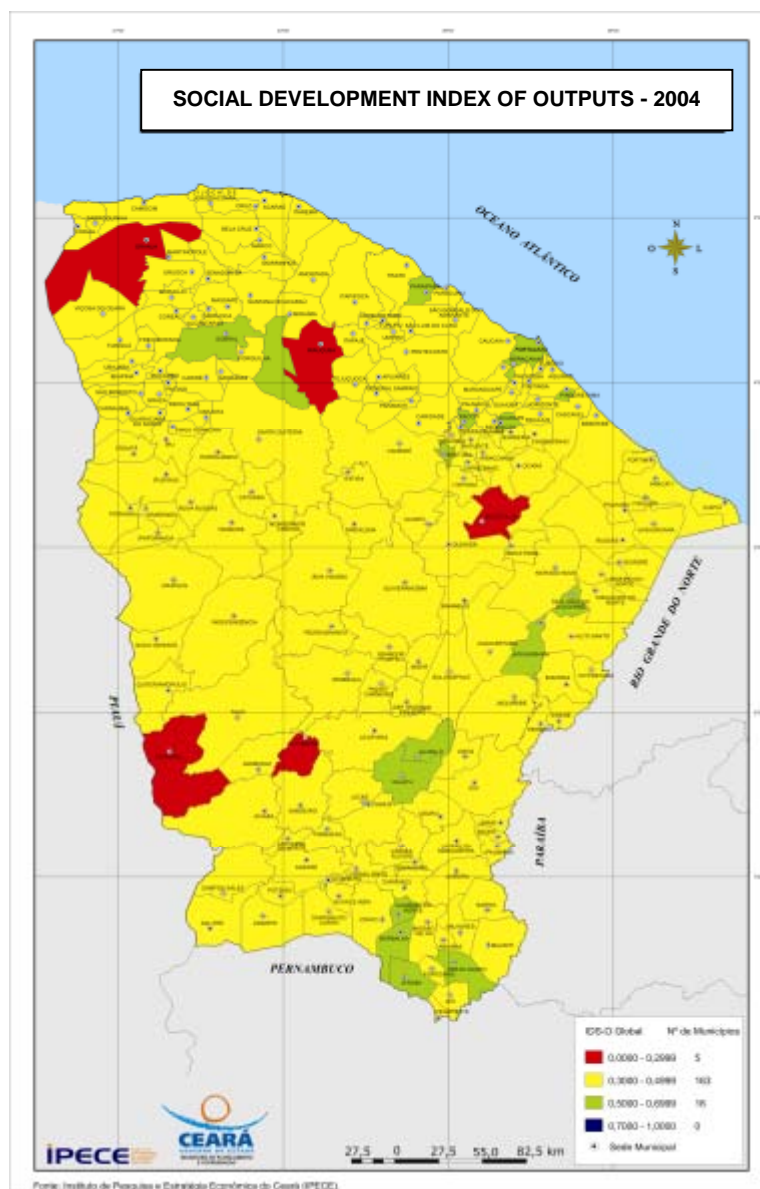
Calculations of the SDI-O for the years 2002, 2003 and 2004 showed that, in general, there have not been relevant changes on the distribution of the municipalities' indices, remaining practically unchanged during the period, even though a slight trend of improvement can be detected as Table 2 indicates.

**TABLE 2**  
**Number of municipalities according to their relative concepts**  
**Outputs – 2002-2004**

Concept	Year		
	2002	2003	2004
Great	0	0	0
Good	10	12	16
Regular	166	159	163
Bad	8	13	5

Source: IPECE.





### 5.3 The interaction between the SDI-R and the SDI-O

Based on the 2004 data, the proposed econometric model was estimated<sup>7</sup> and the results are presented below<sup>8</sup>.

<sup>7</sup> The Ramsey RESET Test confirmed the specification of the econometric model. For further details about this test, see GUJARATI (1995).

<sup>8</sup> Similar results were found for the years 2002 and 2003.

**TABLE 3**  
**Estimation Results of the Regression – 2004**

Variable	Coefficient	Std. Error	t-Statistic	P-Value
C	0.232376	0.028606	8.123435	0.0000 *
SDI-O	0.571832	0.068256	8.377791	0.0000 *
DIST	-0.000214	2.98x10 <sup>-5</sup>	-7.181597	0.0000 *
DENS	3.61x10 <sup>-5</sup>	1.91x10 <sup>-5</sup>	1.885507	0.0610 **
DENS <sup>2</sup>	-4.06 x10 <sup>-9</sup>	2.43x10 <sup>-9</sup>	-1.667595	0.0971 **
<b>R<sup>2</sup></b>	<b>0.565518</b>	<b>F-Statistic</b>		<b>58.24629</b>
<b>Adjusted R<sup>2</sup></b>	<b>0.555809</b>	<b>P-value (F-Statistic)</b>		<b>0.000000 *</b>

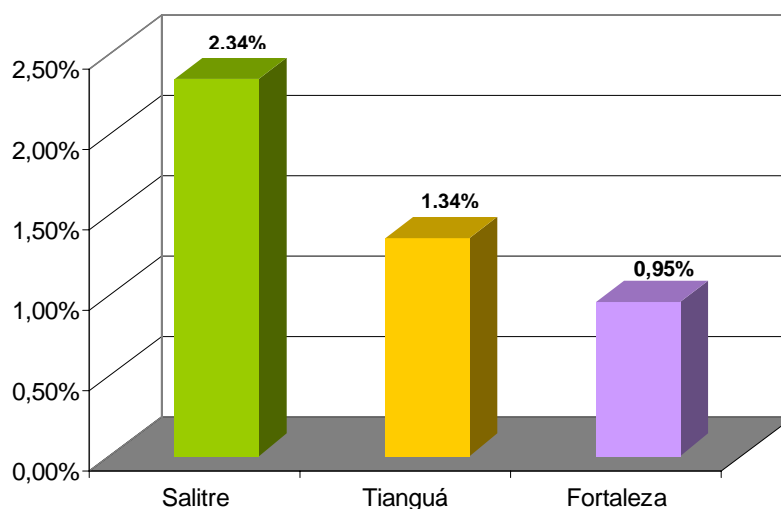
Notes: (a) Dependent Variable: SDI-R.  
 (b) Estimation method: Ordinary Least Squares.  
 (c) Included Observations: 184.  
 (d) Estimated with the White's Consistent Matrix for the correction of heteroskedasticity.  
 (e) \* Significant at 5%. \*\* Significant at 10%.

As Table 3 shows, the model presented a good adjustment specially when one considers the existing heterogeneity among Ceara's municipalities. This is confirmed through the analysis of the values of the R-squared, adjusted R-squared, and t and F tests. All the parameters were considered statistically different from zero. Furthermore, all hypotheses assumed previously in relation to the signal of the parameters were confirmed.

More specifically, the existing relation between the SDI-O and the SDI-R is positive and linear, i.e., the municipalities that present the best outputs tended to yield the best outcomes. But, as mentioned before, the increment on the results in proportional terms would be differentiated, according to their existing SDI-O's and SDI-R's.

At this point, an interesting exercise would be to estimate the effect of an increase of 0.01 in the SDI-O in three municipalities: Salitre, Tiangua, and Fortaleza. Salitre is one of the poorest municipality in the State while Fortaleza is the most developed. Tiangua occupies an intermediary position. Results are presented in Figure 2, below.

**FIGURE 2**  
**Relative Effect on the SDI-R Due to a Change of 0,01 in the SDI-O**  
**Salitre, Tianguá and Fortaleza – 2004**



Hence, for an increase of 0.01 in the SDI-O, keeping everything else constant, the SDI-R is expected to increase 2.34% in Salitre, 1.34% in Tianguá, and 0.95% in Fortaleza. Then, in proportional terms, the impact of such an increase would be greater in a municipality as Salitre, which has a SDI-R much smaller than Fortaleza. And, it should also be considered that, in absolute terms, less resources would be demanded in order to increase Salitre's SDI-O as compared to Fortaleza, basically due to differences in the size of the population and infrastructure.

In accordance to these estimates, there would be a clear policy indication. If the goal is to reduce the disparities among Ceara's municipalities in terms of their social indicators, then, resources should be allocated primarily to those that present the lowest values of the SDI-R, giving emphasis to the dimensions that they present the worst conditions.

#### **5.4 The performance of social indicators**

The available data also allows the analysis of the performance of social indicators. In terms of outcomes, performance will be measured by the SPI-R, as mentioned before. This index will also be used to verify if the social inclusion rule that was previously defined is being achieved.

At this point, it is worth mentioning that this monitoring is a very important part of the

implementation of Ceara's social policy, as it indicates if the efforts made by the government are being able to promote growth with social inclusion. The results obtained since 2003 could be summarized as follows:

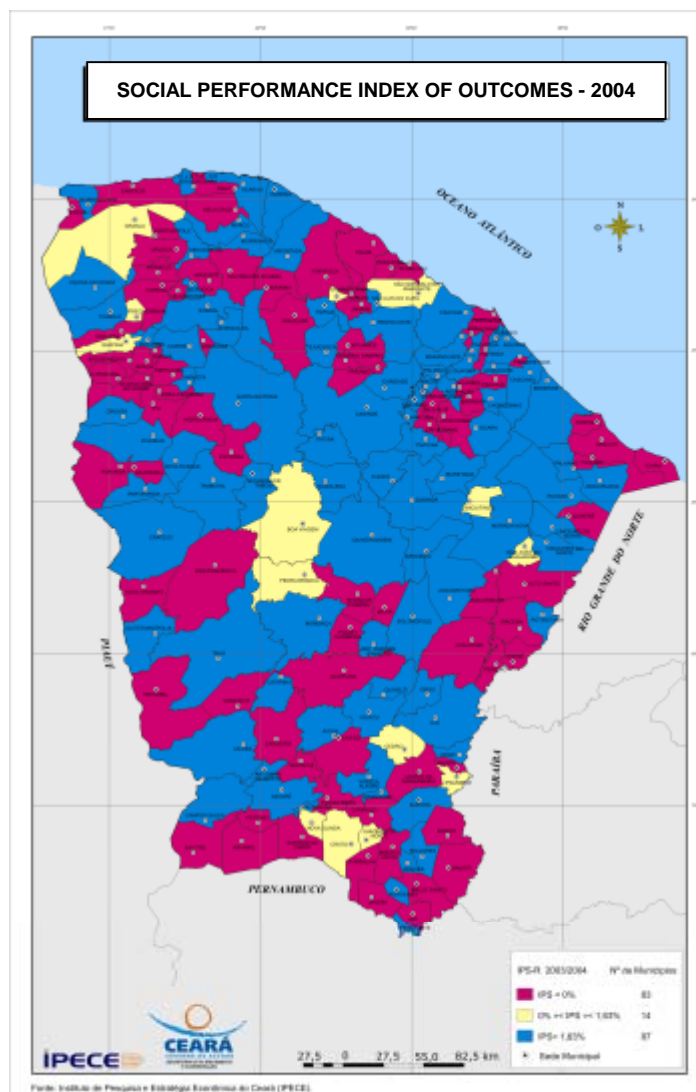
	<b>SPI-R</b>		<b>Δ% Per Capita GDP</b>
<b>2003</b>	4.74%	>	-0.84%
<b>2004</b>	1.63%	<	2.54%
<b>2003-2004</b>	6.45%	>	1.68%

As the data indicate, the social inclusion rule was achieved in 2003, but not in 2004. However, during the period in consideration, one can easily see that social performance was significantly greater than economic performance.

Considering Ceara's municipalities, in 2004, SPI-R calculations indicate that:

- 87 municipalities presented SPI-R's that are positive and greater than the State's average;
- 14 municipalities presented SPI-R's that are positive but smaller than the State's average;
- 83 municipalities presented SPI-R's that are smaller than 0.00%.

Hence, most part of Ceara's municipalities was able to advance in their social indicators in 2004 in relation to 2003, and almost half of them presented performances that were superior to the State's average. These findings can be illustrated with the help of the map below:



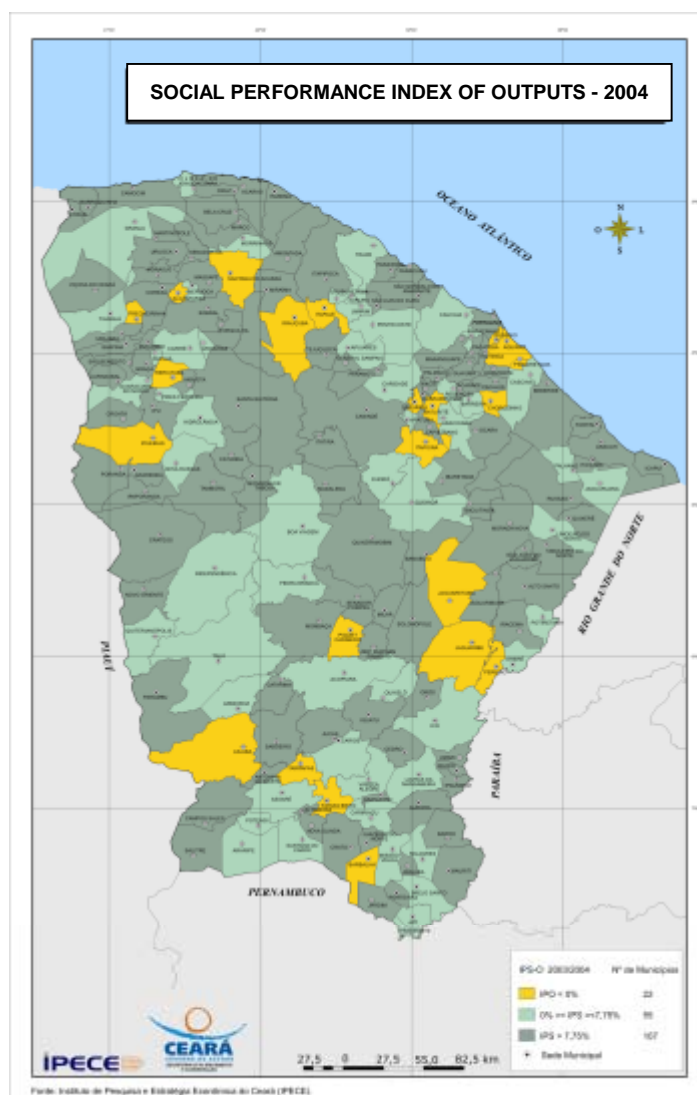
Now, considering the performance of social output indicators, that is measured by the SPI-O, as mentioned earlier, the data indicate that this index was equal to 7.75% in 2004.

And, considering Ceará's municipalities, in 2004, SPI-O calculations indicate that:

- 107 municipalities presented SPI-O's that are positive and greater than the State's average;
- 55 municipalities presented SPI-O's that are positive but smaller than the State's average;
- 22 municipalities presented SPI-O's that are smaller than 0.00%.

These findings (illustrated in the map below) are indeed very promising since, as it

was explained before, the generation of outputs is one of the essential factors to the achievement of outcomes. The important point to consider is that there could be a lag between advances in the provision of public social goods and services and improvements in social inclusion. Hence, given SPI-O results, it is reasonable to expect positive repercussions in terms of outcomes in the following years.



## 5.5 The behavior of the SDI\*

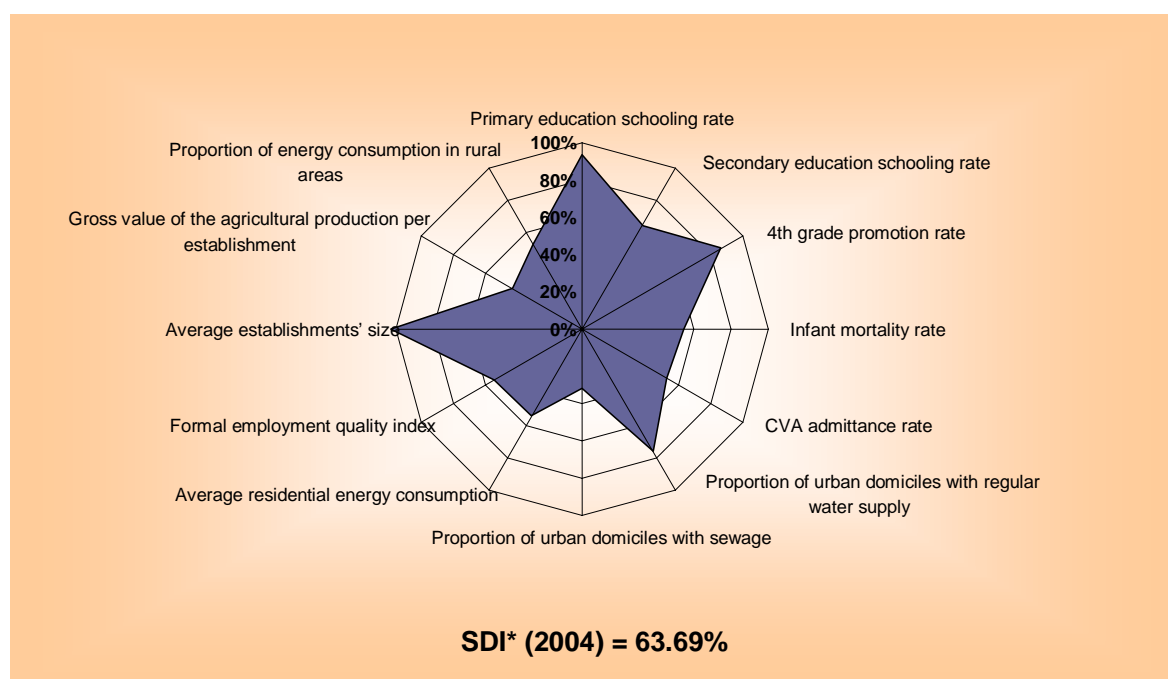
In Table 4, the value of the indicators that describe the current situation in terms of social inclusion as well as their desired values in the medium run are presented.

**TABLE 4**  
SDI\* – Current and Desired Situation – Ceara – 2004

Dimensions	Indicators	Current Situation	Desired Situation	Criteria
1. Education	Primary education schooling rate	93.96%	100.00%	100% Coverage
	Secondary education schooling rate	35.08%	54.70%	Highest rate in Brazil (Sao Paulo)
	4 <sup>th</sup> grade promotion rate	80.44%	93.60%	Highest rate in Brazil (Santa Catarina)
2. Health	Infant mortality rate	22.08	12.01	Reduce by half
	CVA admittance rate	7.14	3.75	Reduce by half
3. Living Conditions	Proportion of urban domiciles with regular water supply	75.50%	100.00%	100% Coverage
	Proportion of urban domiciles with sewage	25.41%	80.00%	80% Coverage
4. Employment and Income	Average residential energy consumption	1,079	2,028	Brazilian average
	Formal employment quality index	30.71%	56.37	Brazilian average
	Average establishments' size	9.71	9.44	Sao Paulo
5. Rural Development	Gross value of the agricultural production per establishment	R\$ 5,829	R\$ 13,711	½ Brazilian average
	Proportion of energy consumption in rural areas	7.93%	14.95%	Brazilian average

From these indicators, then it is possible to compute the SDI\* for 2004, and compare the Ceara that we are with the Ceara that we want to be, as the figure below illustrates:

**FIGURE 3**  
The Ceara that we are and the Ceara that we want to be - 2004



In Figure 3, the area defined by the largest polygon represents the desired situation, i.e., the situation where all indicators are exactly equal to what it is desired. Meanwhile, the dark purple area inside the polygon represents the current situation that, according to the value of the SDI\* for 2004, represents approximately 63.69% of the desired scenario.

A similar exercise was done for 2002 and 2003, when the SDI\* was equal to 58.90% and 61.60%, respectively, which indicates that, during the 2002-2004 period, Ceara has been advancing and getting closer to the desired situation.

## **6. MONITORING THE MDGs IN CEARA**

In the context of the present discussion, it is important to monitor Ceara's position in relation to the Millennium Development Goals. In fact, these are country-level goals, but the Government of Ceara took the responsibility to monitor them at the state level. However, some of the indicators proposed are not readily available at the state level and, then, it is necessary to propose a few adaptations in order to make this monitoring feasible. Hence, some of the indicators proposed were substituted by others, whenever possible, and other indicators related to the goals were also included in the analysis.

A synthetic way to present the results of this monitoring process is to formulate an index that consists on the average of the ratios between the values of the indicators in a certain year and the desired indicator values in 2015, according to the MDGs. Then, two analyses will be possible. First, in a given year, one will be able to identify which indicators are closer to the desired values and which are the ones that the Government should give more attention in the following years. Additionally, when two years are compared, one will be able to ascertain if the State is getting closer to achieving the goals over time.

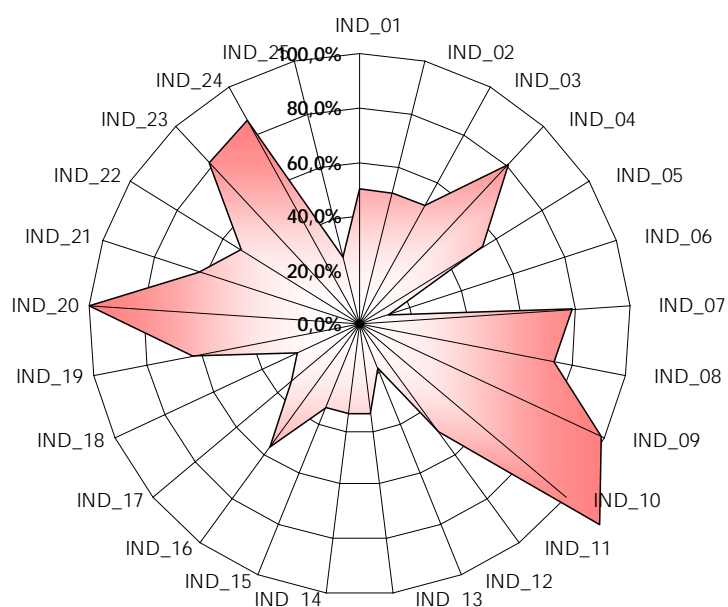
In this analysis, two years were considered: 1992, that was considered the base year, and 2004. The indicators used in this analysis were the following:



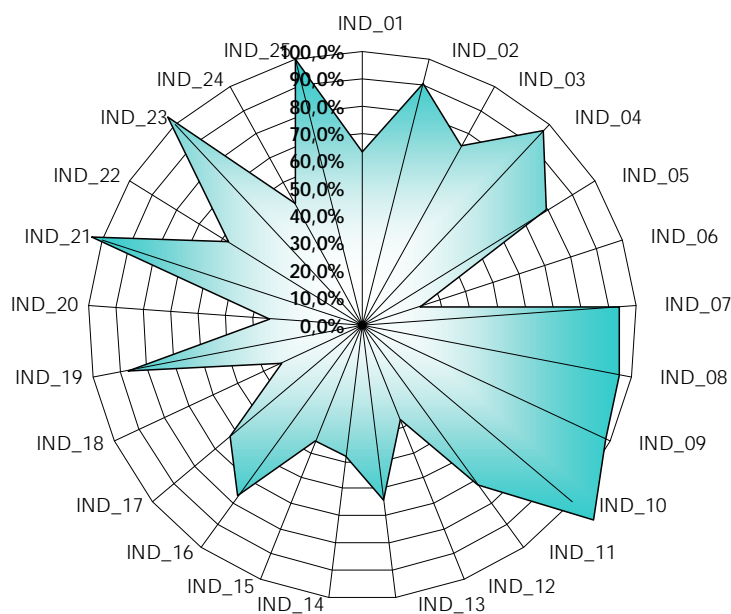
- IND\_01: Proportion of people below the poverty line (in %)
- IND\_02: Proportion of people in extreme poverty condition (in %)
- IND\_03: Participation of the poorer 20% on income (in %)
- IND\_04: Percentage of children (7-14 years of age) attending school
- IND\_05: Percentage of people (15-17 years of age) attending school  
Percentage of people (15 years of age or older) with at least a high school
- IND\_06: education
- IND\_07: Illiteracy rate (15-24 years of age)
- IND\_08: Literate women and men ratio (15-24 years of age)
- IND\_09: Percentage of women enrolled in primary education
- IND\_10: Percentage of women enrolled in secondary education
- IND\_11: Men and women average income ratio (10 years of age or older)
- IND\_12: Women participation in the State Assembly (in %)
- IND\_13: Infant mortality rate
- IND\_14: Diarrhea mortality rate (5 years of age or younger)
- IND\_15: Respiratory infection mortality rate (5 years of age or younger)
- IND\_16: Vaccine coverage rate (in %)
- IND\_17: Respiratory infection admittance rate (5 years of age or younger)
- IND\_18: Maternal mortality ratio
- IND\_19: Percentual of mothers with 4 or more prenatal consultations
- IND\_20: AIDS incidence rate
- IND\_21: Percentage of domiciles with adequate access to water
- IND\_22: Percentage of domiciles with adequate access to sewage
- IND\_23: Percentage of urban domiciles with adequate trash collection
- IND\_24: Unemployment rate (15-24 years of age)
- IND\_25: Proportion of domiciles with telephone lines (including cellular)

Figure 4, below, presents the synthetic results of the monitoring of the MDGs for the years 1992 and 2004.

**FIGURE 4**  
**Monitoring the MDGs - Ceara - 1992/2004**



**Average = 56.53% (1992)**



**Average = 72.19% (2004)**

As the figure above indicates, Ceara is being able to improve overall social conditions so that the situation in 2004 is closer to the achievement of the Millenium Development Goals than it was in 1992. In some cases, indicators were already at levels compatible with the MDGs or at least very close to the desired values (indicators 2, 4, 7, 8, 9, 10, 21,

23, and 25). Some indicators, on the other hand, need to receive further attention in order to reach the desired levels, since they represented less than 50% of the desired value in 2004 (indicators 6, 12, 14, 15, 18, and 20).

## **7. CONCLUDING REMARKS**

This paper presented the social inclusion policy of the State of Ceara. According to this policy, the State is developing a system based on indicators and policy rules that attempts to put in operation its main goal, which is to improve the well-being of its population through social inclusion.

The initial results achieved, according to the different methodologies presented, are positive. In fact, the State of Ceara was able to advance, in general and in some specific dimensions.

It is important to realize that, with the proposed system, it is already possible to identify where and in which dimensions the State should intervene more promptly and intensively, justifying the importance of measuring the concept of social inclusion.

Each methodology used was able to provide extremely important information to the decision-making process, and to guide the allocation of the scarce resources available.

Obviously, the system proposed is still being fully implemented and the measurement of results and impacts of public policies will become more evident and will yield more subsidies to the Government as new information and data are available. This indicates that it is very important to monitor and evaluate the Government's intervention through its social inclusion policy in order to verify if it has been able to truly improve the quality of life in Ceara.

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