The human development in Tunisia: synthetic indicators (HDI) and regional disparities

التنمية البشرية في تونس: المؤشرات التأليفية والفوارق الإقليمية والجهوية

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Abstract:

The aim of this article is, at first, to analyze the performances and results of the experience of human development in Tunisia. The first part will be centered on the progress of two synthetic indicators: the HDI (Human Development Indicator, as defined by UNDP) and our own approach based on synthetic indicators of human development (Synthetic HDI).

In the second part of the article, our aim is, to study the regional disparities and territorial inequalities of human development in Tunisia: first, we will realize Factorial components analysis. Then, we will analyze the progress of synthetic indicators of human development in every region, thanks to our approach based on the HDI (Human Development Index), the HPI ((Human poverty Indicator) and a synthetic indicator of human development in every region and governorate.

Key words: *Human development ; regional development ; Human development indicator ; Human poverty Indicator ; Synthetic indicators of development ; regional disparities*

ملخص:

الهدف من هذا المقال هو أولاً تحليل نتائج تجربة التنمية البشرية في تونس. سيركز الجزء الأول على تطور مؤشرين تأليفيين: مؤشر التنمية البشرية(HDI) (كما حدده برنامج الأمم المتحدة للتنمية) ونهجنا الخاص القائم على المؤشرات التأليفية للتنمية البشرية Synthetic HDI(مؤشر التنمية البشرية التأليفي).

في الجزء الثاني من المقال ، هدفنا هو دراسة الفوارق الجهوية والتفاوتات الإقليمية للتنمية البشرية في تونس: أولاً ، سنقوم بتحليل احصائي أو بتحليل المكونات الرئيسية (ACP). بعد ذلك ، سنقوم بدراسة تطور المؤشرات التأليفية للتنمية البشرية في كل منطقة ، وذلك بفضل نهجنا القائم على مؤشر التنمية البشرية (HDI) ، ومؤشر الفقر البشري (HPI) ومؤشر تأليفي للتنمية البشرية في كل منطقة و محافظة.

الكلمات المفتاحية: *التنمية البشرية ؛ التنمية الإقليمية ؛ مؤشر التنمية البشرية ؛ مؤشر الفقر البشري؛ مؤشرات التنمية التأليفية ؛ الفوارق الجهوية*

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Introduction

Despite the complexity of development factors, the role of human resources and their contribution to the take-off of each country remains undeniable, that's why we are seeing more and more confirmation of strategies relating to capital investment, human resources and the development of human resources.

This pre-eminence of the human factor has been further confirmed on the politico-scientific scene during the last decade (in particular thanks to development specialists) after the publication of the UNDP of the first world report on human development in 1990, which officially establishes the primacy - or at least the need - for the human dimension in development approaches and policies.

In Tunisia, the problem is posed differently, since the Tunisian developmentalist approach has granted, since the first years of independence, a preponderant role to the human and social aspect and has made the promotion of man a real priority. This choice may constitute the main particularity of Tunisian policy and it may, moreover, explain the country's performance in the socio-economic field and more particularly in the field of human development.

However, these performances and this progress should not hide the existence of certain indisputable limits of the Tunisian development policy, in particular the persistence of regional disparities and the geographical distribution of the various services of the development policy.

We will therefore begin by studying the progression of synthetic human development indicators in Tunisia, the HDI (Human Development Indicator, as defined by UNDP) and our own approach based on synthetic indicators of human development (Synthetic HDI). In the second part of the article, our aim is, to study the regional disparities and territorial inequalities of human development in Tunisia: first, we will realize Factorial components analysis. Then, we will analyze the progress of synthetic indicators of human development in every region, thanks to our approach based on the HDI (Human Development Index), the HPI ((Human poverty Indicator) and a synthetic indicator of human development in every region and governorate.

1. Evolution of synthetic human development indicators in Tunisia

1.1- Recent progression of the HDI

The HDI (or the Human Development Indicator) is a summary indicator which makes it possible to measure the evolution of socio-economic indices and which reflects the progress made and the advances made in particular in terms of human development.

In this regard, the three essential elements - forming the HDI - relate to longevity (measured by life expectancy), knowledge (measured by school enrollment and literacy rates) and standard of living (measured by purchasing power, i.e. real GDP per capita).

This HDI represents the arithmetic mean of the following three components:

- the economic or standard of living index: represented by GDP per capita in terms of purchasing power parity.

-the education index: measured by a weighted average of two-thirds of the adult literacy rate and one-third of the school enrollment rate at all levels.

- the longevity index: measured by life expectancy at birth.

The indices are calculated on the basis of the following formula:

Index= (Actual value - minimum value) / (maximum value - minimum value).

The minimum and maximum values for each of these elements are as follows:

Indicator Minimum value Maximum value

Life expectancy 25 85
Literacy rate 0 100
School enrollment rate 0 100
GDP per capita (PPP) 100 40000

For example, the HDI for Tunisia in 2000 (according to UNDP data in 2002) is calculated as follows:

-Economic index: (log 6363 – log 100)/(log 40000-log100)
-education index: (72-0)/(100-0)
- health or longevity index: (70.2 -25) / (85-25)
The arithmetic mean of these three indicators gives us an HDI equal to 0.722.

Although the concept of human development is broader than the HDI, the existence of a synthetic and composite indicator makes it possible to focus attention on certain criteria and on a few particular problems. In this respect, the HDI makes it possible to measure three fundamental elements of human development, which reflect progress made in terms of income and in the education and health sectors.

The progress - in terms of income, health and education - has been undeniable thanks, among other things, to the improvement in purchasing power, the decline in illiteracy and to the increase in life expectancy. Subsequently, this improvement in socio-economic indicators has had an undeniable impact on the evolution of the HDI, which has experienced very significant progress in recent decades, as shown in the following table:

Table 1. Evolution of the HDI (1960-2007)

Year	HDI (Old methodology)
1960	258
1970	340
1975	514
1980	588
1985	613
1990	646
1995	654
2000	678
2005	758
2006	763
2007	769

Source: UNDP: Human Development Reports 1990-2009

Table 2. Evolution of the HDI (1990-2019) (New methodology)[1]

Year	HDI (New methodology)
1990	567
2000	651
2005	688
2010	716
2015	729
2019	740

Source: UNDP: Human Development Report 2020

In terms of evolution, the comparative progress of Tunisia is remarkable: "for the period 1970-1980, Tunisia is the 5th country which has made the most progress, in absolute terms, with an improvement of 191 points; for the period 1960-1992, the country comes in 4th position after Malaysia, Botswana and Korea (with 432 points)"[2]. Finally, for the decade (1990-2000), Tunisia is the 5th country which has made the most progress (with an improvement of 76 points) after Equatorial Guinea, China, Cape Verde and Vietnam with an improvement of 123, 101, 89 and 83 points respectively.

Using the new HDI methodology, we also see a clear increase in the index over the last three decades, although this improvement has been relatively "slow" over the last decade (2010/2019), with an increase of the HDI by only 25 points.

In terms of relative progress (i.e. in terms of average annual growth of the HDI), this index rose from 258 to 722 between 1960 and 2000, i.e. an average annual growth rate of 2.6%.

For the period 1975-2000, for example, the table below shows that Tunisia is the country which has made the most progress (after Indonesia) in absolute terms with an improvement of 208 points ; thus, Tunisia is in the lead of the international community and of the countries that have made the most notable progress.

If we integrate the data of the world report on human development in 2005, we also find a substantial improvement of 239 points, which places Tunisia at the head of the countries (before Indonesia) having made the most progress in their HDI, as shown in the following table:

Table 3. Progress of the HDI (75-2003) in Tunisia and in other countries ((The 10 best scores)

Country	HDI in 1975	HDI in 2000	HDI progress Between 75-2000	HDI in 2003	HDI progress Between 75-2003
1-Indonésie	469	684	215	697	228
2-Tunisie	514	722	208	753	239
3-Egypte	435	642	207	659	224
4-Chine	523	726	203	755	232
5-Algérie	501	697	196	722	221
6-Corée (Rép.de)	691	882	191	901	210
7-Maroc	429	602	173	631	202
8-Arabie saoudite	587	759	172	772	185
9-Inde	407	577	170	602	195
10-Malaisie	616	782	166	796	180

Source: Calculations prepared by us from UNDP data (Human Development Reports 2002 and 2005)

Moreover, and if we consider the starting socio-economic level, a study carried out by the UN services showed that "on a sample including Algeria, Bolivia, China, Honduras, Swaziland , Tunisia, Turkey and Zimbabwe, which report a similar starting point in 1975, Tunisia shows the most substantial increase in its HDI, preceded only by China"[3].

In terms of HDI deficit reduction (this deficit being the difference between the maximum HDI value - which is equal to 1 - and the value obtained by the country), the annual rate of deficit reduction went from 1.2% during the 1960-1970 period to 2.7% in 1970-1980 and 4.4% between 1980 and 1995, which enabled Tunisia to improve its ranking from 53rd position during the first decade to the 20th position during the period 1980-1995 (still in terms of HDI deficit reduction)[4].

On the other hand, this significant progress recorded in terms of human development has not remained without effects on social indicators, which once again reflects Tunisia's socio-economic performance. Certain indicators are eloquent in this regard: according to the various world reports on human development, Tunisia is one of the countries which have achieved the most spectacular reductions in the mortality of children under 5 (from 184% in 1970 to 37% in 1995, i.e. an 80% reduction placing the country in 7th place) and for the monetary poverty rate (falling from 33% to

6.2% between 1967 and 1995, i.e. an 81% drop placing Tunisia in first place since it recorded the most spectacular reduction in poverty)[5].

In summary, the evolution of the HDI shows that Tunisia has regularly been among the countries that have posted the best results in terms of human development. These performances can also be clarified by using other indicators such as synthetic human development indices.

1.2. The importance of a synthetic human development index or a synthetic HDI

The analysis of the level of human development can be facilitated by the use of a multitude of indicators which reflect various socio-economic aspects, and this, thanks to a synthetic index which takes into consideration the multifaceted aspect of the problem of development and which integrates the different manifestations of reality (economic, social, demographic, etc.).

As Amor Belhedi has shown[6], the problem is: "How to grasp the unique and the multitude at the same time? How to measure the multitude by the unique? and since we are faced with a single reality, but which is multifaceted (economic, demographic, social, mental manifestations, etc.), we can measure the different aspects by a single indicator which is a coefficient of socio-economic development (or in our case a synthetic human development index).

Thus, using a synthetic HDI for the year 1966, and basing - in the calculation of each indicator - on the above-mentioned methodology (for the HDI), we find the following results:

Table 4. The synthetic indicator of human development in 1966

Indicator	Score
Economic index[7]	592
1- unemployment index[8]	696
Literacy rate[9]	321
1- TMI index[10]	696
Running water supply rate	149
Electrification rate	239
1- poverty index[11]	389
Urbanization rate	401
Longevity index[12]	451
Synthetic HDI[13]	437

Source: Calculations prepared by us (based on NIS data: GPHC 1966 and Consumption survey 65-68)

It seems that the composite indicator can reflect the progress of human development and socio-economic advances more clearly than the HDI since it is not content to measure the evolution of the economic, health and educational indices but it also integrates many indicators relating to different demographic, economic and social areas such as employment, infrastructure, mortality, etc., without neglecting educational indices, standard of living and longevity.

In this regard, the synthetic HDI rose to 437 in 1966, taking into account the average expenditure at constant prices at 1995 prices (if we replace the average expenditure per household at constant prices by expenditure at current prices, we obviously find another economic index equal to 150 and consequently another HDI equal to 398).

Using this same method for the other periods, and referring to the same components of our synthetic HDI, we find the following results:

Table 5. Evolution of the synthetic human development indicator (1975, 1984, 1994, 2000, 2005 and 2014/2015)

Indicator	1975	1984-85	1994-95	1999-2000	2004-2005	2014-2015
Economic index	690	789	814	858	902	962
1-unemployment index	742	738	688	684	722	704
Longevity index	655	702	773	793	808	833
1- TMI index	655	785	898	921	933	953
Literacy rate	450	538	683	730	771	807
Running water supply rate	265	494	691	752	835	846
Electrification rate	377	634	859	946	949	966
Urbanization rate	480	528	610	624	649	678
1- poverty index[14]	560	846	876	916	924	941
Synthetic HDI	541	673	766	803	**832**	**854**

Source: Elaborated by our calculations, based on NIS data *(GPHC 1975-1984-1994, 2004 and 2014, Population Employment Survey 1999 and Consumption surveys 75-85-95-2000, 2005 and 2015)*

This table shows that the evolution of our synthetic HDI was very close to that of the HDI as calculated by the UNDP in the various global human development reports. Indeed, the HDI exceeded - in both cases - 500 in 1970, 600 in 1985 and it is close to 700 and 800 respectively for 1995 and for 2000, whereas it exceeded 832 in 2004 and 854 in 2015.

Thus, the contribution of GDP shows the importance of the economic dimension, which contributes by more than a third, and all the more so since this contribution has been - from a longitudinal perspective - on the rise: "This means that the progress made in economic terms are relatively more important than those achieved in terms of health or education"[15].

On the other hand, the contribution of the economic component has been decreasing in our composite indicator - despite the improvement in the standard of living index - because of the integration of the unemployment rate in our calculations and the increase in this rate over the last two decades (going from 12.8% in 1975 to 15.8% in 1999) which has affected our employment index (1- unemployment index) which has gone from 742 to 684 between 1975 and 2000.

This is combined with the importance of social indicators in our approach (8 indicators out of 10) while these constitute only 2/3 for the HDI.

2. The regional disparities of human development in Tunisia

In the first part of the article, we have shown that the experience of human development in Tunisia is characterized by an improvement in socio-economic indicators, which has had repercussions on the evolution of the HDI and the synthetic indicator of human development, which have made significant progress in recent decades, both in absolute and relative terms, which has allowed improve Tunisia's ranking more substantially than most other countries (Bousnina A., 2006)[16].

However, these performances and this progress should not hide the existence of certain indisputable limits of the Tunisian development policy, in particular the persistence of regional disparities and the geographical distribution of the various services of the development policy[17].

In this regard, one may wonder whether this territorial distribution is egalitarian or unequal? Is it equal or unequal regional development, and has developmental policy favored some regions over others?

To answer these questions, we are going to focus our interest on the regional variations of human development, and this through two very useful statistical methods for the study of regional disparities: firstly, the Factorial Analysis in Principal Components and secondly our approach based on the composite human development indicators by region, or the HDIs, HPIs and synthetic human development indicators by region and by governorate.

However, the study of regional inequalities through synthetic indicators by region and by governorate was confronted with 2 major *methodological problems*, namely the administrative division and the availability of data. As such, the unavailability of certain components of the HDI and the HPI has forced us to substitute them with other data that can reflect the evolution of the socio-economic situation and human development in general. For the HDI for example[18], the economic index or the standard of living by region is approximated by the average expenditure (per person or per household), and this, because of the unavailability of the GDP per capita (through the PPP) by region or by governorate. Sometimes, this economic index is approximated by the unemployment rate, because the average expenditure is not available by governorate ((Bousnina A., 2007).

The same goes for the health index, because the other component of the HDI, namely life expectancy, is not available by region and by governorate in 1966, which is why the health index was approximated in several cases by the infant mortality rate.

This problem also concerns the Human Poverty Index or the HPI[19]. Because of the unavailability of the probability of dying before age 40 and of the proportion of children suffering from underweight, we found ourselves obliged to replace these variables by the general mortality rate and by the infant mortality rate.

We will therefore begin with a diachronic analysis based on PCA (Principal Component Analysis) in order to identify the level of regional development between 1975 and 2014. In the second part, we will focus our interest on the analysis of regional disparities thanks to the composite indicators of human development, in this case the HDIs, the HPIs and the synthetic indicators of human development by region and by governorate.

2.1. Principal Component Analysis

Factorial Analysis in Principal Components facilitates the elaboration of an overall coefficient of development which can express the level of development reached by each governorate. This PCA can be carried out in two ways: the first concerns a PCA analysis of 23 variables (13 in 1966 and 18 in 1975) which are sometimes different between 1966 and 2014 and the second concerns a PCA of 18 common variables for all the periods (1975, 1984,1999, 2004 and 2014).

The common variables (which are available for all periods) between 1975 and 2104 concern the various areas relating to human and socio-economic development, namely education, health, economy and standard of living. These are the following variables:

* Literacy
* Male Literacy
* Female Literacy
* The level of education of the population (women)
* The level of education of the population (men)
* Hospital beds
* The IMT
* Unemployment index
* The population employed in services
* The population employed in manufacturing industry.
* Population Density
* Proportion of households connected to the sanitation network (ONAS)
* Proportion of households with a bathroom (SB)
* Running water supply (Water)
* Electrification rate
* Urbanization

* Proportion of rudimentary housing (Log.rud)
* Proportion of households with 2 or more rooms.

The correlation between the first PCA factor and these variables is very high. This correlation exceeds (in 2004, for example) 0.9 for several variables such as literacy or urbanization or running water supply. It is 0.8 for the electrification rate, 0.7 for the connection to sewers and 0.6 for the economic variables[20].

The first PCA factor, which expresses the level of socio-economic development, summarizes the main data (71% in 1975, 65% in 1984, 65% in 1999, 64% in 2004), the other components of the PCA express respectively 10% and 8% in 2004. These three factors restore more than 82% of the variance in 2014.

Examining the scores of the governorates on factor I makes it easier for us to analyze the degree of development of each governorate. Table 2.1 allows us to clearly see the regional hierarchy and the ranking of the regions according to their scores and their level of development.

In 2004 for example, the three highest positive scores were recorded in the District of Tunis, while the last four places were occupied by the governorates of the Center West and by Jendouba. After the District of Tunis, the best scores are still recorded in Monastir and Sousse (followed by Sfax and Nabeul) unlike Mahdia whose score is negative, which is diametrically opposed to the position of the other governorates of the Centre-East. Mahdia -and Zaghouan too- are therefore closer to the inland regions which -all- record a negative score, and this concerns the governorates of the North West and especially those of the Center West whose level of development is the lowest in the country (both in the educational and health level than at the economic level and basic equipment).

The intermediate position (between the two antipodes, namely the Capital and the Center West) is occupied by the regions of the South which record a positive score (except Gafsa and Tataouine) in particular thanks to the improvement of socio-collectives services (Bousnina A., 2012).

Table 6. Scores of governorates on factor I between 1975 and 2014

Gouv.	1975	Rank	1984	Rank	1999	Rank	2004	Rank	2014
Tunis	2,852	1	2,423	1	1,993	1	1,830	1	1.437
Ariana	-	-	1,081	4	1,188	4	1,511	3	1.354
B. Arous	-	-	1,788	2	1,482	3	1,582	2	1.337
Manouba	-	-	-	-	-	-	0,700	6	0.631
Nabeul	0,352	6	0,330	7	0,493	6	0,346	8	0.550
Zaghouan	-0,558	13	-0,868	19	-0,891	19	-1,021	19	-0.232
Bizerte	0,148	8	0,092	11	0,081	14	0,007	14	0.366
Beja	-0,586	14	-0,725	17	-0,661	18	-1,111	21	-0.380
Jendouba	-0,852	15	-1,042	20	-1,203	21	-1,328	23	-0.878
Le Kef	-0,210	10	-0,727	18	-0,565	17	-0,700	18	-0.205
Siliana	-0,968	17	-1,075	21	-1,124	20	-1,091	20	-0.440
Sousse	1,068	3	1,024	5	1,025	5	1,058	5	1.101
Monastir	1,205	2	1,261	3	1,515	2	1,455	4	1.012
Mahdia	-0,475	12	-0,611	16	-0,482	16	-0,436	17	-0.017
Sfax	0,855	4	0,719	6	0,484	7	0,548	7	0.465
Kairouan	-0,954	16	-1,345	24	-1,490	23	-1,381	24	-0.802
Kasserine	-1,026	18	-1,247	23	-1,656	24	-1,440	25	-1.001
S.Bouzid	-1,239	19	-1,234	22	-1,343	22	-1,245	22	-1.073
Gabes	-0,019	9	0,213	10	0,214	9	0,151	11	0.176
Medenine	-0,239	11	0,018	12	0,132	12	0,278	9	-0.104
Tataouine	-	-	-0,403	15	-0,093	15	-0,197	16	-0.373
Gafsa	0,202	7	0,016	13	0,124	13	-0,060	15	-0.347
Tozeur	-	-	0,232	8	0,405	8	0,277	10	0.334
Kebili	-	-	-0,357	14	0,188	10	0,116	13	-0.290
Tunisia	0,447	5	0,227	9	0,182	11	0,151	11	0.382

Source: Elaborated by our calculations, based on NIS data

It should be noted that Tunisia's score was 0.151, which places it in eleventh place, showing the regional imbalance where most of the country (14 governorates) is below the national average.

In summary, the governorates can be divided into two large equal groups (12 governorates each): the first is characterized by positive scores (ranging from Tunis, which has the highest score, to Bizerte, whose score is close to 0) and the second is characterized by negative scores ranging from –0.06 in Gafsa to –1.44 in Kasserine which ranks last.

We can compare the results or scores obtained for the different periods in question. For this, and like the method of fractional scores, we brought the scores to a fixed reference (which is the highest score, always recorded in Tunis) to be able to compare the evolution of the different regions and know the improvement or decline in the position of each governorate.

Despite the improvement in the scores of several regions, some governorates have experienced an undeniable decline in their position over the past thirty years, while others have experienced a stabilization of their rank.

Referring to 1975 and then to 1984 (thanks to the similarity of the administrative division with 2004), we first notice the improvement in the position of Gabes and Medenine thanks in particular to the importance of the industrialization of the first and the diversification of tertiary activities (including tourist activity) for the second. The same goes for Nabeul and especially for Monastir thanks to their diversified economy and the tourist "take-off" of these two regions. This improvement is also observed in the governorates of the South such as Tozeur or Kebili in which there is a high level of development of infrastructure and socio-collective equipment.

Finally, we note an improvement in Ariana's score from 2004, after the creation of the governorate of Manouba, which was integrated into Ariana before 2000 and which is often late compared to the other governorates of the District of Tunis because of the weakness of its socio-economic indicators.

On the other hand, there is a drop in the rank - even in the score - of Gafsa which recorded a negative score in 2004, unlike 1975 to 1984 and 1999, thus reflecting the deep crisis in the region based in particular on the “mining economy”.

In addition, other governorates experienced a certain stabilization of their situation between 1975 and 2014. These include Sousse, which maintained its "privileged" position behind the District of Tunis and Monastir (still occupying the first ranks). Similarly, this stabilization concerns disadvantaged regions whose "marginalization" has been constant throughout recent decades: evidenced by the consistently negative scores of all the governorates of the North-West and Center-West throughout the period 1975-2014 (if not since 1966): it is a ‘‘**dominated and exploited periphery,** which is continually being emptied of its human and economic content" and which remains disinherited ‘‘because of unemployment, insufficient investment and the severe natural conditions”[21].

2.2. Evolution of the HDI by region and by governorate

2.2.1. HDI by region

Thanks to the availability of data on life expectancy from 1975, our HDI is very close to that defined by the UNDP (except for the economic index because of the unavailability of GDP/Hab PPP). Thus, the HDI represents the arithmetic mean of the following three components:

- the economic or standard of living index: approximated by the average expenditure per person (at current prices).
-the education index: measured by the adult literacy rate (10 years and over) (in %)
-the health index: measured by life expectancy at birth.

The indices are calculated on the basis of the formula mentioned above. However, changing the indicators involves changing the minimum and maximum values, as shown in the following table:

Table 7. The minimum and maximum values of the components of the HDI

	Minimum value	Maximum value
Expense per person	40	2000
Literacy rate	0	100
Life expectancy	25	85

The calculation of these 3 indices and the HDI gives us the following results:

Table 8. HDI by region between 1975 and 2015

Région	HDI in 1975	HDI in 1984	HDI in 1994	HDI in 2000	HDI in 2004	HDI in 2010	HDI in 2015[22]
District-Tunis	594	721	823	870	803	826	**860**
North-East	504	635	759	801	775	813	721
North-West	387	529	689	754	704	748	623
Center-West	363	523	669	716	711	734	**554**
Center-East	580	661	795	837	806	839	750
South-East	430*	581	732	791	780	770	660
South-West	-	591	728	788	747	723	686
Tunisia	479	623	757	806	767	800	728

**This index concerns the entire South Source: Elaborated by our calculations, based on NIS data*

After 1966 (period during which the South occupied the last place and recorded the lowest scores), the regional typology has not been upset since 1975 and the level of development of the regions (and subsequently their ranks) has not been changed (except for nuances): "The Capital always retains the first rank, it is followed by the governorates of the Center-East (Sousse, Monastir and Sfax) while Cap-Bon (and the North-East generally) and the South occupy an intermediate position before the disadvantaged areas of the Centre-West and North-West whose scores are negative"[23]. In addition, the regions that have reached the average HDI are - as usual - the coastal areas of the country, namely the Capital, the North East and the Center East.

On the other hand, if we use a synthetic HDI, we can more easily integrate the multifaceted aspect of human development by taking into consideration the different aspects of regional development, which will allow us to show more clearly the economic and social inequalities between different regions.

Table 9. Synthetic index of HD between 1975 and 2015

Région	**DT**	**NE**	**NW**	**CW**	**CE**	**SW**	**SE**	**Tunisie**
Synthetic index of HD (1975)	744	582	468	442	634	537*	-	537
Synthetic index of HD (1984)	814	679	557	534	730	671	631	673
Synthetic index of HD (1994)	868	756	664	628	808	759	749	761
Synthetic index of HD (2000)	889	796	709	681	833	785	785	794
Synthetic index of HD (2004)	878	800	708	706	837	808	815	804
Synthetic index of HD (2010)	**835**	760	622	**616**	781	668	730	748
Synthetic index of HD (2015)[24]	**723**	597	493	**419**	643	527	523	609

**This index concerns the entire South Source: Elaborated by our calculations, based on NIS data*

If we take the better endowed region (District of Tunis) and the less developed one (the Center West), the comparison of the scores of the two zones (in the different areas) allows us to know the evolution of the gaps and their aggravation or on the contrary their attenuation. The general evolution of the various indices (economic, social, and educational) between 1975 and 2015 shows very clearly the persistence of regional inequalities for certain indicators and the attenuation of disparities for others.

First, there is a very significant attenuation of the gaps in several areas such as poverty, mortality, electrification and economic indicators. These differences varied, in 1975, between 100 and 250 points (640 for electrification) while the difference varies between 40 and 86 points in 2000 and in 2004 for most cases and it has dropped very sharply for electrification not to exceed 18 points or 1.8%.

Secondly, we should note - on the other hand - the persistence of inequalities in other areas in which interregional disparities are still considerable. In addition to the difference in terms of literacy (254 points in 2000 and 187 points in 2004), the gap in terms of urbanization and running water supply remains dizzying with a difference in 2000 of 617 and 501 points respectively. This difference also remained very significant in 2004 -despite the slight drop- with differences of 601 and 410 points.

Nevertheless, the general improvement of the indicators had as a corollary the reduction of the overall disparity, that is to say by referring to the synthetic HDI. This reduction was gradual since the difference between the extremes was 240 points in 1994, 208 points in 2000 and 219 points in 2010.

Moreover, the regional stratification which emerges from the analysis of the evolution of the synthetic HDI is similar to that which emerges from the study of the classic HDI. Although the North-West and Central-West HDIs recorded the fastest average annual growth, these two regions occupy the last place in 1975, 1984 and 1994. Likewise, the same order has been maintained, during all these years with the intermediate place of the North East, while the first and second places are occupied respectively by the Tunis region and the Center East.

Another time also, and following the example of the classic HDI, we find that none of the interior regions reaches the level of the national threshold, and only the coastal areas of the eastern facade (District of Tunis, North-East and Center East) were able to achieve this performance. The persistence of this lacuna during all the phases of the study (1975, 1984, 1994, 2000, 2004, 2010 and 2015) clearly indicates the chronic and lasting nature of the regional imbalance.

On the other hand, the analysis by governorate of the "classic" HDI and the synthetic index of human development can confirm this geographical dichotomy favoring the coastal governorates.

2.2.2. HDI by governorate

Like the HDI by region, our HDI by governorate is very close to the classic HDI thanks to the availability of data on life expectancy and literacy. On the other hand, the economic index is approximated by the unemployment index (due to the unavailability of the DPA by governorate). The calculation of the 3 indices and the HDI gives us the following results:

Table 10. HDI by governorate between 1975 and 2015[25]

	HDI (in 1975)	HDI (in 1994)	HDI (in 2000)	HDI (in 2004)	HDI (in 2010)	HDI (in 2015)[26]
D. Tunis	**702**	775	779	803	826	814
Nabeul	680	762	797	803	817	761
Zaghouan	592	609	637	689	829	623
Bizerte	590	704	725	752	802	716
Beja	552	665	684	717	769	610
Jendouba	**448**	638	680	683	721	**503**
Le Kef	521	627	635	686	771	627
Siliana	470	625	639	703	738	599
Sousse	660	759	770	808	826	799
Monastir	682	**786**	**802**	**842**	**877**	**836**
Mahdia	643	684	748	765	785	626
Sfax	683	759	767	800	852	673
Kairouan	529	651	663	707	769	553
Kasserine	517	**599**	**603**	**680**	**689**	**520**
S.Bouzid	**504**	670	725	723	732[27]	**514**
Gabes	603	711	733	761	768	671
Gafsa	592	656	677	716	692	588
Medenine	634	742	759	799	796	581
Tunisie	**616**	**715**	**736**	**767**	**800**	**698**

Source: Elaborated by our calculations, based on NIS data

It appears from these tables that the classification of governorates (mentioned above) was respected since the highest level of human development was recorded in the coastal regions, both in 1975 and 1994 and in 2000 and 2015. The six most important HDIs and the first six places concern the governorates of: Tunis, Nabeul, Sousse, Monastir, Sfax and Medenine. On the other hand, the lowest scores were recorded in 1975 in Jendouba and Siliana, in 2000 in Kasserine and Kef and **in 2015 in Jendouba, Kasserine and Sidi Bouzid.**

However, the use of the "classic" HDI may conceal certain indisputable shortcomings, in particular because of the limited number of variables used. For example, the most developed region of the country - in this case the Capital - only occupied third place in 2000 because of the high unemployment rate (unlike Monastir and Nabeul) whereas it is obvious (as seen in the previous paragraphs) that the best indicators in most socio-economic areas are recorded in the District of Tunis. In addition, and due to the limitation of the number of variables, the increase or decrease in the value of an indicator can directly affect the level of the HDI: this is shown by the case of Kef and Sidi Bouzid which have in reality a close level of development, but which recorded in 2000 a difference - in favor of the HDI of Sidi Bouzid - of almost 100 points because of the high level of unemployment in Kef (although the education and longevity indices are less reared in Sidi Bouzid).

In short, the classic HDI has certain drawbacks, because it is limited to 3 variables, which means that the significant increase or decrease in a single indicator can significantly affect the level of the HDI. This is why the synthetic index can reflect - more clearly than the HDI - the socio-economic progress and the progression of human development by integrating the standard of living, the

infrastructure, the demography..., and this, without neglecting the economic, educational and longevity index[28].

The calculation of the synthetic human development index since 1975 gives us the following results:

Table 11. Synthetic index of HD between 1975 and 2015[29]

	HDI (in 1975)	HDI (in 1984)	HDI (in 1994)	HDI (in 2000)	HDI (in 2004)	HDI (in 2010)	HDI (in 2015)[30]
D. Tunis	703	755	**828**	**840**	**852**	**817**	**723**
Nabeul	521	626	727	760	776	796	638
Zaghouan	444	463	589	636	684	765	535
Bizerte	496	583	691	719	745	778	616
Beja	441	496	624	651	684	677	517
Jendouba	384	437	581	615	647	632	**427**
Le Kef	425	495	620	648	699	701	526
Siliana	369	433	576	615	678	665	502
Sousse	575	697	784	798	822	787	699
Monastir	609	727	**816**	**831**	843	**820**	**701**
Mahdia	455	508	631	688	728	712	555
Sfax	561	640	721	740	776	802	614
Kairouan	392	441	570	609	672	686	450
Kasserine	374	430	560	**591**	**665**	**601**	**414**
S. Bouzid	356	401	**555**	627	665	696	**395**
Gabes	475	579	712	743	769	721	567
Gafsa	531	585	706	732	755	647	490
Medenine	442	573	709	745	808	741	518
Tunisia	493	593	**705**	**734**	**769**	**763**	**609**

Source: Elaborated by our calculations, based on NIS data

In terms of evolution, the most substantial progress has been observed in Sidi Bouzid and Siliana, which are the only governorates (along with Medenine) which recorded an HDI TAAM above 2% between 1975 and 2000. This rate is largely higher than that of the most developed regions with a TAAM of 0.7% and 1.2% respectively in Tunis and Monastir. Nevertheless, these performances and this progression nonetheless conceal considerable disparities. Despite all the regional development actions undertaken since independence, the gap between certain regions remains -until today- very significant reaching in 2010 nearly 220 points between the synthetic HDI of the District of Tunis (or Monastir) and that of Kasserine. The score for this region was still very low in 2010 since it was well below the national average of more than 160 points. Also in 2004, the gap remains very wide between the first and last ranks with a difference of more than 220 points between Tunis and Jendouba. The score of the latter is lower than the average of the country by more than 120 points.

In this regard, it should be noted that out of the 18 governorates concerned, **only 7 of them reached in 2000 - and also in 2004 and 2015- the national threshold and they are all coastal**, which once again reflects the chronic and structural nature of the regional imbalance (this remark is also observed in 1966, 1975, 1984 and in 1994).

On the other hand, and following the example of the analysis of the evolution of the synthetic HDI by major region, the study of the evolution of this index by governorate shows the persistence of certain inequalities and the reduction of other disparities. In terms of employment, the gap between the "extremes" is still considerable due to the very high unemployment rate in certain governorates such as Le Kef and Kasserine. The gaps also persist in terms of running water supply, literacy and urbanization with a difference ranging from 270 points to 780 points. These inequalities have, on the other hand, decreased significantly in other areas such as longevity, mortality and electrification.

Moreover, the classification of the regions - thanks to the attribution of a rank to each governorate according to its synthetic HDI - shows that the regional typology was not upset between 1975 and 2015. Indeed, the first 9 places were occupied by the same governorates (all coastal in general) in 1975, 1984 and 1994 as well as in 2004 and 2015.

The Capital, Monastir and Sousse have always occupied the first 3 places while Nabeul conquered fourth place from Sfax (which occupied it before 1994) while Gabes and Medenine saw a gradual improvement in their scores, unlike Gafsa who occupied fifth place in 1966 and 1975 and whose situation deteriorated from the 1980s with the crisis in the mining economy.

Similarly, the most "disadvantaged" regions kept the same rank and maintained their last places during this period. What is very paradoxical is to find not only that **the first 9 places** were always occupied by the same 9 zones, but also to notice that **the last 5 places** are always occupied by the same governorates (all interior). These are Sidi Bouzid, Kasserine, Kairouan, Jendouba and Siliana; in other words, it is the entire **Center West and 2 North-West** governorates which represent the most marginalized areas of the country.

In addition, the regional typology of development can also be studied using other human development indicators which take into account above all the social and human aspect such as the Human Poverty Index or the HPI. This is what we will study in what follows.

2.3. Evolution of the HPI by region and by governorate

2.3.1. HPI by region

Compared to the HPI (human poverty index) as defined by the UNDP, our HPI by region retains illiteracy and the proportion of people without access to running water (data available by region and even by governorate), and this unlike the other two indicators, namely:

- the probability of dying before the age of 40 (which is approximated in some tables by the TBM and in others it has been neglected, because general mortality has clearly decreased in Tunisia and no longer allows a differentiation between regions)

-The proportion of children (under 5 years old) suffering from underweight and which is approximated by the TMI index[31].

Calculating these indices and the HPI gives us the following results:

Table 12. HPI by region between 1975 and 2015 [32]

Région	HPI in 1975	HPI in 1984	HPI in 1994	HPI in 2000	HPI in 2004	HPI in 2010[33]	HPI in 2015[34]
D.Tunis	**260**	**179**	**093**	**069**	**72**	**152**	**089**
NE	418	315	195	157	158	161	207
NW	492	397	284	249	260	225	299
CW	**539**	**437**	**320**	**280**	**282**	**235**	**388**
CE	337	253	160	125	119	**137**	170
SW	406*	333	180	142	126	248	208
SE	-	369	211	169	142	200	235
Tunisia	345	315	198	160	153	175	201

**This index concerns the entire South Source: Elaborated by our calculations, based on NIS data*

Throughout the study period, in 1975, 1984, 1994, 2000, 2004, 2010 and 2015, human poverty was highest in the North West and Center West and lowest in the District of Tunis and the Center East. Despite the general improvement in the indicators (reduction of the HPI by 309 points) and particularly in the interior regions (with the regression of the HPI by 232 and 257 points respectively in the North West and the Center West between 1975 and 2004), human poverty is still high in these regions, mainly because of the poor supply of running water and illiteracy, particularly in the Center West.

On the other hand, the District of Tunis has experienced the least progress (-190 points) because its level (69 in 2000) is close to the ideal (0), and if we eliminate illiteracy which is still not negligible, the Capital's HPI would be very close to the ideal state (with an index equal to 36). This regional divide can be confirmed by studying the evolution of the HPI by governorate between 1975 and 2015.

2.3.2. HPI by governorate[35]

Table 13. HPI by governorate between 1975 and 2015[36]

	HPI (1975)	HPI (1984)	HPI (1994)	HPI (2000)	HPI (2004)	HPI (2010) [37]	HPI (2015)[38]
D. Tunis	**324**	**226**	**113**	**083**	**72**	**152**	**089**
Nabeul	564	373	227	169	138	159	175
Zaghouan	604	493	327	273	210	144	268
Bizerte	536	393	242	205	166	171	201
Beja	576	472	325	294	245	205	278
Jendouba	609	508	388	358	290	251	340
Le Kef	566	472	334	306	236	203	275
Siliana	638	519	381	324	249	233	304
Sousse	488	279	145	108	85	152	114
Monastir	460	234	118	**086**	**71**	**099**	**095**
Mahdia	605	470	321	256	181	187	252
Sfax	515	362	226	183	138	126	232
Kairouan	650	546	385	343	276	201	367
Kasserine	649	531	399	**374**	**289**	**278**	**371**
S. Bouzid	**663**	**566**	**415**	332	270	237	**430**
Gabes	576	418	221	168	127	204	184
Gafsa	552	435	228	186	141	280	228
Medenine	615	478	276	226	148	175	284
Tunisia	543	394	243	199	154	175	201

Source: Elaborated by our calculations, based on NIS data

This table shows that the regional typology has been maintained with the same ranks for almost all the governorates. Of course, these are the same indicators used for the calculation of the HDI, but it should be noted that for the HPI by governorate it is the arithmetic mean of 3 variables and not of 9 or 10 indices. The persistence of the same regional stratification can be attested by the classification of the different governorates over the entire period 1975-2015. Indeed, the last 5 places (where human poverty is the highest) are often occupied by the same 5 areas, namely the 3 governorates of the Center West (Kasserine, Kairouan and Sidi Bouzid), Jendouba and Siliana. Similarly, the first 7 places are maintained by the coastal regions, ie. the District of Tunis, Monastir, Sousse, Nabeul, Sfax, Gabes and Bizerte.

Like the HDI, it is only those governorates that have reached or approached the national threshold and recorded an HPI lower (or very close) to the national HDI, unlike other regions - such as Kasserine or Jendouba - where human poverty affects more than a third of the population (this is why the gap between the extreme regions is still considerable, bordering, in 2000, 300 points and in 2004 nearly 220 points between the District of Tunis and Kasserine, *in 2015, 340 points between the District of Tunis and Sidi Bouzid*) ((Bousnina A., 2019).

On the other hand, the use of other indicators and other methodologies brings out *the same regional typology reflecting the marginalization of the interior and the development of the coast.* For example, UN studies using a Human Lack Indicator (HLI) show very significant interregional disparities in education and quality of life. According to these studies, the governorate of Tunis with only an HLI of 15% in 1984 is clearly in the lead, the governorate of Sidi Bouzid with a rate of 56%

(i.e. a difference of nearly 41 points) comes in last position with markedly behind the national average. In 1994, Tunis still kept the first rank and Sidi Bouzid the last rank. In this respect, the coastal/interior divide is striking since in 1984 as well as in 1994 we find the District of Tunis, Monastir and Sousse in the leading pack, while the interior regions of Kasserine, Sidi Bouzid, Kairouan, Jendouba and Siliana remain at the bottom of the ranking[39].

The persistence of the same regional typology is attested by this UN classification. Indeed, these five governorates mentioned above - ranked last - are exactly the same with reference to our HDI or our HPI or the HLI as calculated by the UN. Even if another HLI is calculated in 2004 and then in 2011, the regional classification remains almost the same (for example, in 2004, the HLI is equal to 150 in Tunis and 440 in Kasserine; in 2011, this HLI is lower than 175 in the Center East and it is almost 400 in the Center West).

Conclusion

In the first part of the article, we have attempted to show that the improvement in socio-economic indicators has had repercussions on the evolution of the HDI and the synthetic indicator of human development, which have experienced significant progress in recent decades, both in absolute terms and in relative terms, which has improved Tunisia's ranking more substantially than most other countries. This comparative progress of Tunisia and this improvement of its position compared to other countries have been verified despite the modification of the measurement indicators, and this, both by referring to the HDI and by using the synthetic index of human development.

However, these performances and this progress should not hide the existence of certain indisputable limits of the Tunisian development policy, in particular the persistence of regional disparities.

Subsequently, despite the significant improvement in indicators in all regions (thanks to the increase of the HDI and the regression of the HPI), interregional disparities remain considerable and the uneven regional development remains thorny. This inequality is evidenced by the persistence of the same regional typology since 1975 (if not since 1966) which favors coastal governorates to the detriment of inland areas. Throughout this period, the same regional stratification was maintained with the same ranks for almost all the governorates, since the two best positions are always monopolized by the District of Tunis and the Centre-East while the last two places are "the prerogative" of the North-West and the Center-West, while the intermediate position is occupied by the North-East and the South.

For both the HDI and the HPI, the last 5 positions are occupied by the same governorates (all inland) and the first 9 places are occupied by the same areas (often all coastal). This explains the delays for the governorates at the bottom of the ranking compared to the national average and especially in comparison with the better off regions. Both for the classic HDI and for the synthetic HDI and for the HPI, we find that none of the inland regions reaches the level of the national threshold, and only the coastal areas of the eastern facade (District of Tunis, North- East and Centre-East) were able to achieve this performance. The **persistence** of this lacuna during all the phases of the study (1975, 1984, 1994, 2000, 2004, 2010 and 2015) clearly indicates the chronic and lasting nature of the regional imbalance.

The multiplicity and the change of statistical methods of classification cannot, in any case, transform the persistence of the same "law" of regional development in Tunisia, which remains an uneven development clearly characterized by the same regional stratification and by the magnitude of the economic and social **inequalities between the marginalized and dominated interior (the periphery) and the coast (or the center) with its most developed regions.**

In summary, "the hierarchical structure of development remains" and "the gaps between regions persist without spectacular improvement or over-deepening"[40], which poses the problem of unequal development with acuity. If we rely on this conclusion, we are able to affirm that there are *several Tunisias in the same country, distinguishing* **"developed Tunisia" and "underdeveloped Tunisia".**

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Notes

[1] *The formula for calculating the HDI has been modified from 2010/2011. The minimum and maximum values have also been modified (with the maintenance of life expectancy and PPP income). But the most important change concerns the education level index, with the integration of Average years of schooling (in years) and Expected years of schooling (in years) (instead of schooling and literacy).*

[2] *Mongi Bchir (1998). « La politique tunisienne de population : caractéristiques, contenu et résultats » in, Le livre de référence en communication en matière de population, (Collective work). IPSI/FNUAP, Tunis, p.49.*

[3] *ONU (2001). Bilan commun de pays, Organisation des Nations Unies, New York p.12.*

[4] *MDE et PNUD (2001). Rapport national sur le développement humain-1999, Tunis, p.55.*

[5] *PNUD (1997). Rapport mondial sur le développement humain. Le développement humain au service de l'éradication de la pauvreté, New York, Programme des Nations Unies pour le Développement, 1997, p.3.*

[6] *Amor Belhedi (1996). Développement régional, rural et local, Cahiers du CERES, série géographique n°17, Tunis, p.56.*

[7] *It is approximated by expenditure per person (at constant 1995 prices) and it is calculated according to the method mentioned above. The DPA in 1966 is 405 so this economic index is calculated as follows: (log 405 - log 40) / (log 2000-log 40) (2000 and 40 being the maximum and minimum values).*

[8] *This index is calculated based on a minimum value (0) and a maximum value (50). As for the formula for the calculation, it is as follows: Rate/50 (since the minimum value is 0).*

[9] *For the rates, and as we pointed out before (for the education index of the HDI), this indicator remains invariable since the minimum value is 0 and the maximum value is 100.*

[10] *This index is calculated based on a minimum value (0) and a maximum value (300). As for the calculation formula, it is similar to that of the unemployment index (Rate/300).*

[11] *This index is calculated using the same formulas mentioned above (for IMR, Infant Mortality Rate, etc.) but changing the maximum value which is equal to 70 (poverty index=Poverty rate/70). It should be noted, in this respect, that we have adopted the definition of H. Dimassi according to which the poor population would be the "disadvantaged" category having a DPA lower than 50 D, which gives us a poverty rate in 1966 equal at 42.8% (and not 33% as the NIS statistics stipulate).*

[12] *Life expectancy in 1966 is: 51.1 so this index is equal to: (51.1 -25) / (85-25).*
[13] *It is the arithmetic average of the various indicators.*
[14] *This index is calculated using the same formulas mentioned above (for example for the IMR) but changing the maximum value which is equal to 50 (poverty index=Poverty rate/50).*
[15] *PNUD et MDE (2001). Op. cit, p.59.*
[16] *Cf, for more details, Adel Bousnina (2006). « Le développement humain en Tunisie : spécificités et performances économiques et sociales » RTSS, Revue Tunisienne des Sciences Sociales n°130. CERES, Tunis.*
[17] *Cf. Adel Bousnina (2012). Le littoral et le désert tunisiens. Développement humain et disparités régionales en Tunisie, Edition l'Harmattan, Paris.*
[18] *The HDI -as defined by the UNDP- represents the arithmetic mean of the following three components:*
- the economic or standard of living index: represented by GDP per capita in terms of purchasing power parity.
-the education index: measured by a weighted average of two-thirds of the adult literacy rate and one-third of the school enrollment rate at all levels.
- the longevity index: measured by life expectancy at birth.
[19] *The HPI -as defined by the UNDP- represents the arithmetic mean of the following components: illiteracy, the proportion of people without access to running water, the probability of dying before the age of 40 and the proportion of children (under 5 years old) underweight.*
[20] *Of course, the correlation is positive with variables such as the IMR, unemployment, rudimentary housing…because it is not a question of the infant mortality rate or the unemployment rate but of the health indices or the index of the employment whose increase reflects an improvement in the level of human development (in other words, it is: 1-IMR index or 1-unemployment index; the methodology for calculating these indices has been analyzed in a previous work published in RTSS n°130; Cf. A.Bousnina, 2006, p.148).*
[21] *Hafeth Sethom (1992). Pouvoir urbain et paysannerie en Tunisie, Cérès production, Tunis, pp. 217-221.*
[22] *Life expectancy in Tunisia does not allow a great distinction between regions, that's why we used (for the 2015 HDI) another indicator relating to living conditions, namely the rate of connection to the sanitation network (and this in addition to expenditure per person and the literacy rate).*
[23] *Belhedi A. (1999). « Les niveaux de développement régional en Tunisie : analyse comparative de 3 méthodes classificatoires », RTSS, Revue Tunisienne des Sciences Sociales n°119, CERES, Tunis, p.12.*
[24] *The HDI is lower in 2015 compared to previous years for many reasons, including the addition of some indices in the calculation, because these indicators allow a greater distinction between regions; moreover, certain indicators relating to living conditions and education are very low in certain governorates, in particular the rate of connection to the sanitation network, the higher rate of schooling, connection to the Internet, etc.*
[25] *For 2010, we can add other governorates and we find the following HDIs, Ariana: 843, Ben Arous: 840, Manouba: 791, Tozeur: 780, Kebili: 751; Tataouine: 709.*
For 2015, we can add other governorates and we find the following HDIs, Tozeur: 588, Kebili: 568; Tataouine: 561.
[26] *Life expectancy in Tunisia does not allow a great distinction between regions, that's why we used (for the 2015 HDI) another indicator relating to living conditions, namely the rate of connection to the sanitation network (and this in addition to employment index and the literacy rate).*
[27] *The HDI -as well as the HPI and the synthetic HDI- in Sidi Bouzid and Zaghouan (and in some governorates in 2010) is affected by an "unrealistic" unemployment rate, particularly in rural areas where there are a "flagrant" underestimation of unemployment, particularly in regions where there is fairly significant seasonal agricultural employment.*
[28] *Cf. for more details, A.Bousnina (2019). La Tunisie périphérique oubliée, Edition l'Harmattan, Paris.*
[29] *For 2010, we can add other governorates and we find the following HDI: Ariana : 842, Ben Arous : 825, Manouba : 775, Tozeur : 686, Kebili : 696 and Tataouine : 743.*
For 2015, we can add other governorates and we find the following HDI: Ariana : 745, Ben Arous : 742, Manouba : 646, Tozeur : 601, Kebili : 492 and Tataouine : 485.

[30] *As noted previously,the HDI is lower in 2015 compared to previous years for many reasons, including the addition of some indices in the calculation, because these indicators allow a greater distinction between regions; moreover, certain indicators relating to living conditions and education are very low in certain governorates, in particular the rate of connection to the sanitation network, the higher rate of schooling, connection to the Internet, etc.*

[31] *The IMR index is calculated as previously for the HDI (with the formula cited above) but taking a maximum value equal to 200: IMR index= (actual value-minimum value (0))/200.*

[32] *This HPI includes the IMR index, running water supply and illiteracy.*

[33] *This HPI includes the IMR index, the unemployment index and illiteracy.*

[34] *This HPI includes the IMR index, running water supply, the rate of connection to the sanitation network and illiteracy.*

[35] *For 2010, we can add other governorates and we find the following HPI: Ariana : 134, Ben Arous : 138, Manouba : 185, Tozeur : 191, Kebili : 216 and Tataouine : 257.*
For 2015, we can add other governorates and we find the following HPI: Tozeur : 148, Kebili : 252 and Tataouine : 241.

[36] *This HPI includes the IMR index, running water supply and illiteracy.*

[37] *This HPI includes the IMR index, the unemployment index and illiteracy.*

[38] *This HPI includes the IMR index, running water supply, the rate of connection to the sanitation network and illiteracy.*

[39] *ONU (2001). Op. cit, p.69. The HLI is based on the inclusion of the following variables: general mortality - literacy - drinking water supply - sanitation service and unemployment.*

[40] *M.Bchir (1998). Op. cit, p.53.*