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Towards a territorial equity through the criterion-based assessment of socio-economic inequalities. Case of the Province of Boumerdes

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Abstract. In spatial planning, inequalities represent imbalances and disparities in the distribution of income, equipment and development opportunities. For such reason, it is necessary to apprehend, analyze and deal with these disparities, in order to attain the objectives, including the coherent development of the territories. As a fact of matter, the forms of inequalities in Algeria have been the subject of the national policy of planning and sustainable development which were motivated by the implementation of various tools and plans of development at the national, regional and provincial level, namely the National Scheme of Territorial Development (SNAT), the Regional Scheme of Territorial Development (SRAT) and the Plan of Territorial Development of the Province (PATW). Indeed, our study consists of measuring the disparities by adopting economic and housing criteria in the province of Boumerdes, and defining, as consequence thereof, a classification of its whole municipalities in order to be able to reduce the inequalities and to seek other horizons of development in the marginalized zones.

Keywords. Socio-economic inequalities; Economic criteria; Housing criteria; Territorial Planning; Province of Boumerdes

1- Introduction:

In Algeria, the consideration of inequalities has been reflected in the enactment of laws along with the implementation of national policies for territory development, as well as by the National Scheme of Territorial Development (SNAT, 2010) whose aim, amongst others, is to attain social equity and territorial balance, all the way taking into account the specific situations that characterize the territory, and thus constituting a framework of reference for the action of public authorities.

However, the issue of spatial inequalities remains a current topic in the guidelines of spatial planning as it presents the main obstacle to economic development and to welfare of citizens (Cheinini. & Zenasni, 2021). Besides, inequalities generally appear due to a weakness or absence of equal distribution of wealth and development gains between and within countries (Attallah & Bouchama, 2018).

We will endeavour, through this research, to clarify the concept of socio-economic inequality, its dimensions and causes. At that moment, we will then focus on existing methods

and indicators that can be of assistance to measure it in order to remedy the existing dysfunctions and attain a more equitable and more coherent development.

2- Literatures:

In terms of planning, regional disparities or regional imbalance correspond to inequalities, reflected by economic or social variables, in the distribution amongst regions, or even within regions, of income, activities, equipment and development potential (Merlin & Choay, 2010). Nevertheless, inequality is closely related to the notion of disparity, whose definition stands for a difference of level in economic, social, cultural, etc. domains (Brunet, 1992). More to the point, these increasing inequalities are brought about by intensified processes of economic globalization, capital and labour flexibility along with welfare restructuring, as well (Cassiers & Kesteloot, 2012).

In our days, the use of such two terms refers for the most part to an approach in terms of difference: inequality can only be appreciated in dialectic of difference and disparity (Brunet, 1992). Definitely, the persistence and widening of inequalities have shown to be the most tangible manifestation thereto. Likewise, its effects can be synthesized in a disruption of the relations between populations and the nature to which they belong (Khaoua, 2018).

Admittedly, societies organize their space (Figure 01), which organization has its own rules, and symbolizes one of the conditions necessary for their reproduction as societies (Brunet, 1992); in other words, man produces space (development actions) and space influences over society (physical factors and constraints, resources, etc.) (Pecqueur, 2005).

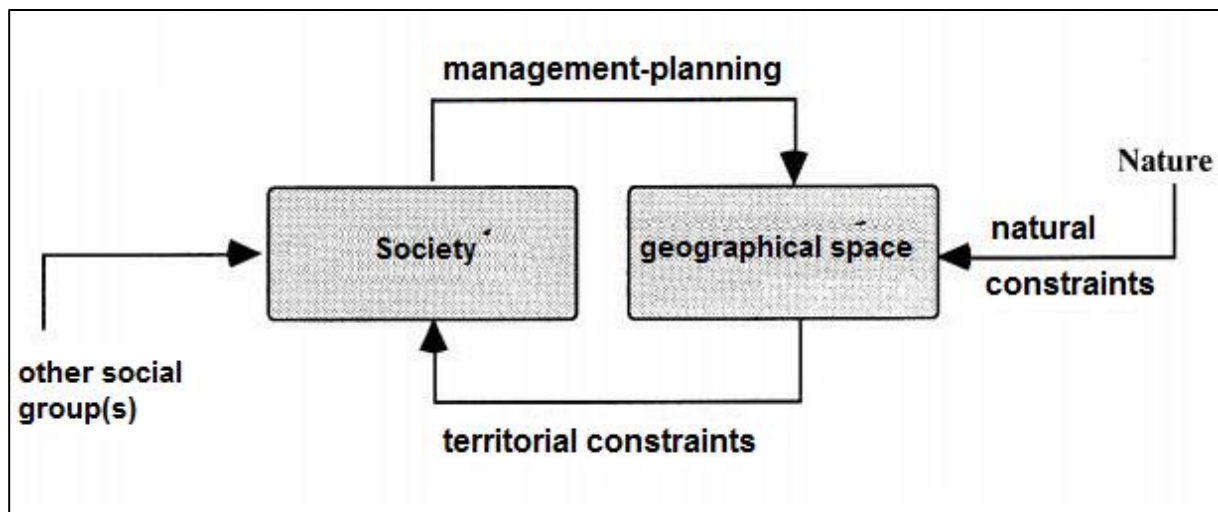


Fig.01: Relation between space and society (Brunet, 1992)

3- Methodology and methods:

In Algeria, measuring socio-spatial inequalities with monetary approaches stands for a difficult exercise because of the lack of data pertaining to the incomes of individuals. For such purpose, the approach adopted in Algeria is the non-monetary approach as the case of “the poverty map in Algeria” (Bouchama & Attalah, 2018). However, due to the complexity of inequalities, their study requires a multi-criteria analysis (Ferats et al. 2022, Oudina et al. 2022). Thus, this is of great importance to combine such two approaches and cross the different variables in order to arrive at better results. For this purpose, it is necessary to synthesize the data all the way through: The construction of synthetic indices and The presentation of

hierarchical tables of indicators. Nowadays, there exist promising new methods for mapping disparities and development gaps with better resolution. Besides, these methods combine traditional data from household surveys with innovative data from cell phones, satellite images, or even text mining. However, their implementation faces significant obstacles of technical and practical nature (Rodríguez-Castelán et al.2019).

1.1 The problem of choice of indicators

The problem of choice of indicators has shown to be complex as there are always several of them and none is in the main relevant on its own (Najib, 2017). Additionally, the same indicator, expressed in absolute values or in values relative to a space or an initial value, can give different results (Bachar, 2016). For instance, some regions can appear very dynamic on a map of evolution whilst their weight is very low down in absolute values.

In order to conduct this study as it should be, it was essential to establish an inventory of our territory for the purpose of identifying the characteristics and specificities thereof, relying more particularly on data from the PATW (Plan of Territorial Development of the Province), and those of RGPH 2008 (General Census of Population and Housing) which will serve as a reference for the analysis part.

In fact, Boumerdes is a coastal province of northern Algeria, which alike represents an integral part of the Algiers metropolitan area. As for the surface of which, it is assessed to 1,488 km². In 2017, the population was noticed to attain 960,315 inhabitants, with an average annual growth rate of 2.01%, according to estimates of 31st December 2017.

Fig.02 Geographical situation of Province of Boumerdes

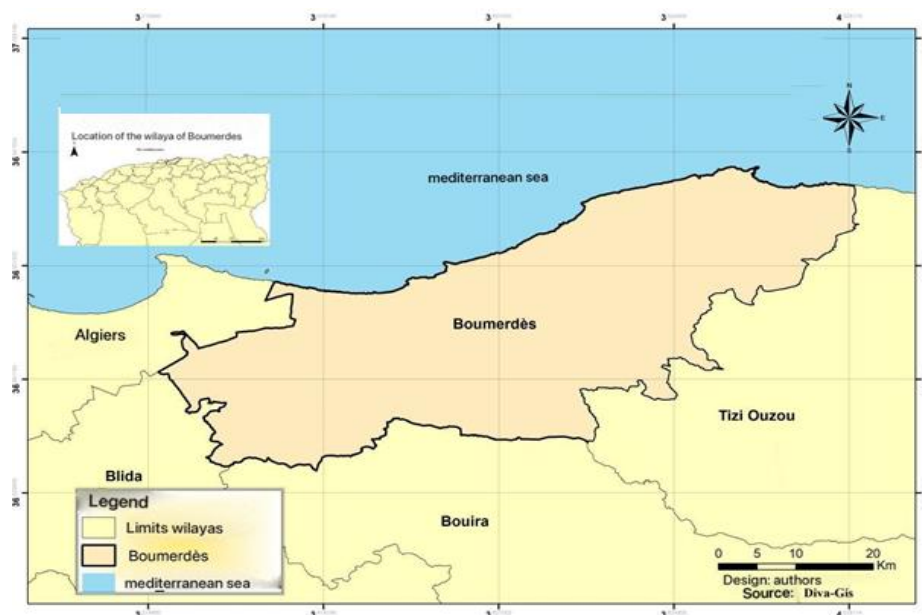


Table. 01: Indicators and indices for the territorial disparities' assessment

Criteria	Indicators	Indices
Economy	1. Irrigated utilized agricultural area % 2. Number of industrial institutions 3. Unemployment rate	Index of economy

Housing	6. Precariousness rate 7. Rate of occupancy per unit 8. Rate of connection to GAS	Index of housing
Health	9. Polyclinic staffing rates 10. Number of general practitioners 11. Number of pharmacies	Index of health
Education	10. Rate of occupancy by overall class 11. Rate of overall enrolment between 06 and 15 years of age 12. Rate of overall teacher staffing	Index of education
Global index of inequalities = Classes of inequalities		

Unquestionably, Boumerdes is marked by social and economic territorial disparities, which explicitly influence over its territorial functioning. However, the study of inequalities is very wide-ranging (Meftah et al, 2021). Besides, it includes four criteria: economy, housing, health and education (UNESCO Institute for Statistics 2009). For each, we have chosen three indicators from which so as to derive synthetic indicators for each criterion. A consequence, an overall inequality index will then be established from the indicators selected in our study. In practice, calculation of the global inequality index and designation of the classes is carried out according to the calculation methodology hereinafter:

We consider that a commune is rated “C”, whilst an indicator is rated “I”. Besides, it is assumed that the municipalities are ranked in descending order of indicator (... <I_c4 < I_c3 < I_c2 < I_c1) which means that I_c1 indicates the richest commune, whilst I_c32 indicates the poorest commune in terms of industry for instance.

In particular, our study will focus on the criteria of the economy, along with those related to housing, so as to delimit the disparities in this field.

A synthetic index “SI” will be constructed for the first criterion Ct₁. We will assign to each indicator “I” a Rank (ranking) in the following manner: I_c1 (1), I_c2 (2) and so forth to be cumulated in such a manner:

Application: Economy “SI” = Unemployment Rank + Industry Rank + Rank Utilised
Agricultural Area “UAA”.

The accumulation of the 4 synthetic indices allows obtaining the overall inequality index: Based on this global index, four classes of inequalities will be created, which will be demonstrated as follows: 01st class: Favoured municipalities, 02nd class: Moderately favoured municipalities, 03rd class: Moderately disadvantaged municipalities and 04th class: Disadvantaged municipalities.

▪ **The indicator of Irrigated Useful Agricultural Area:**

The agriculture sector is witnessing increasing disparities between the city and the countryside, being attributed to many problems, in respect such as industrialization and urbanization (Voiron & Chéry, 2005), according to the useful agricultural area at the end of 2017 in the Province of Boumerdes. Nonetheless, it is noted that the UAA varies from one municipality to another, of which three classes can be distinguished. (Figure 03)

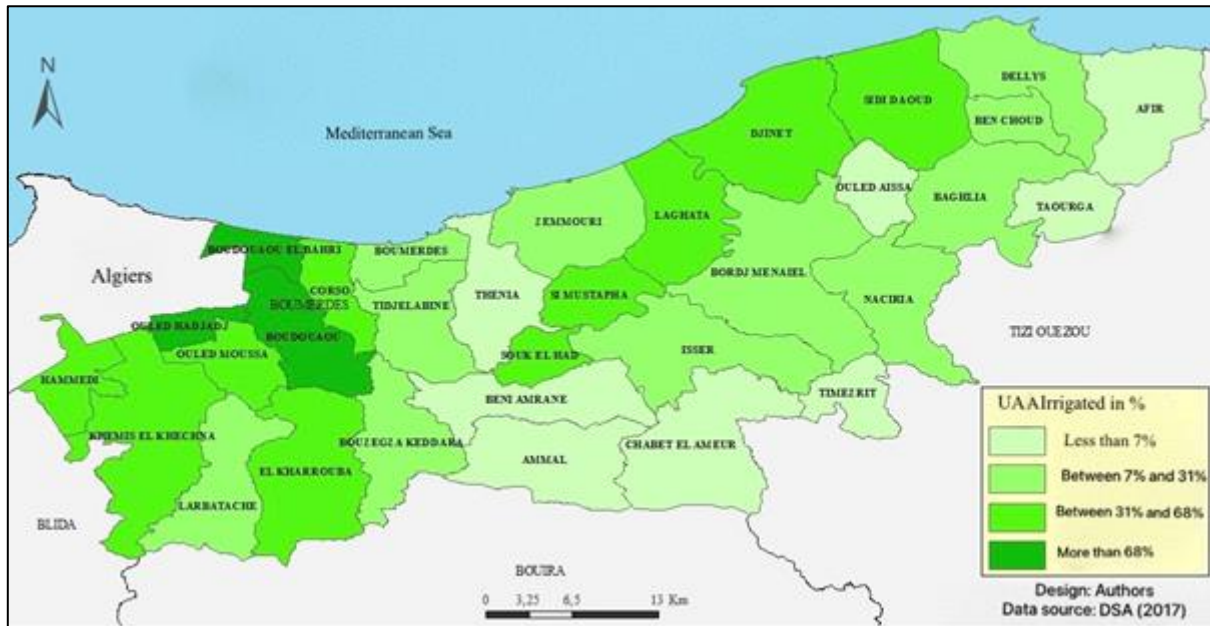


Fig.03: Indicator of the Irrigated Agricultural Area.(DSA,2017)

1.1.1 The indicator of unemployment rate:

The unemployment rate stands for the number of unemployed people expressed as a percentage. Thus, it results from dividing the number of unemployed; that is to say people seeking employment, by the labour force, i.e., the number of people of working age, the whole multiplied by 100.

For calculation purpose of the unemployment rate, we simply need to apply the following formula: **UR** = Unemployment rate. **LF** = Labour force. **EP** = Employed population.

The indicator of the number of industrial institutions

The endowment of the municipalities in terms of industrial institutions, will allow us to categorize them in three classes:

In the **01st class**, economic activity is highly concentrated in the chief town of the province, and in the western municipalities, in respect such as Boudouaou, Khemis El Khechna and Ouled Moussa, but alike in the industrial zones of Bordj Menaïel and Isser, which concentrate a number of institutions assessed to 2,600 units. Hence, this distribution can be explained by the influence of the chief town of the Province on the surrounding municipalities and the spread of activities towards these positions.

The **02nd class** includes the municipalities surrounding the chief town of the province in addition to the municipalities of Dellys, Djinet, Baghliia, Naciria and Chaabet El Ameur, which are alike oriented towards industrial activity and concentrate between 1700 and 2600 units.

The **03rd class** concentrates the municipalities contiguous to the Province of Bouira, in respect such as Ammal and Keddara, in addition to the mountainous municipalities of Taourga and Ben Choud in the eastern part of the province, with a low industrial endowment (less than 700 industrial units). Nonetheless, these municipalities switched to agriculture.

1.1.2 Synthetic index of the economy:

The map represents the synthetic index of the economy in the Province of Boumerdes in 2017. (United Nations Development Programme (**UNDP**); National agency of Territorial Development (**NATD**) 2011), it indicates an unequal geographical distribution of economic potential and employment opportunities, through which we can distinguish 03 classes:

The **01st class** includes the urban, coastal, central and contiguous municipalities of the Province of Algiers, having a favourable situation, like Boumerdes, Boudouaou, Ouled Haddadj, Bordj Menaiel and Djinet. More to the point, these latter are particularly favoured by the strong influence exerted by the metropolis, through the industrial zone Rouïba – Reghaïa, and in consequence by a dense and more or less continuous road network facilitating the exchange operations and communications.

The **02nd class** comprises municipalities whose economic situation is moderately favourable, in respect such as Corso, Thenia, Zemmouri and Tidjelabine, due to the economic influence of the chief town of the province, except for Dellys, which is located at the eastern side. In addition, these municipalities have a strategic geographical location (port, yachting, restaurants, tourist complex, ... as is the case for Corso and Zemmouri.

The **03rd class** includes the municipalities located at the southern side, in respect such as: Beni Amrane, Bouzegza Keddara, Ammal and Timezrit, alongside the municipalities of the eastern side, like Afir, Taourga, Ben Choud and Ouled Aïssa in addition to Si Mustapha. However, these municipalities are mainly located in landlocked areas, in the mountainous part whereat a situation of insecurity still exists. Moreover, the aspect of the relief, mostly rugged characterizing these provinces, affects the human activities being exerted therein. As a consequence, it is noted that the weakness of the infrastructure network has led to the marginalization and isolation of such cities located in the south and extreme east of the province.

Certainly, economic activity is concentrated in the West. Nevertheless, such concentration leads to a large consumption of space to the detriment of natural resources; hence, the agricultural areas located there are threatened. Above and beyond, this economic pressure will subsequently lead to social pressures, overcrowding in densely populated municipalities or deficits in landlocked municipalities. In virtue of which, and for confirmation purpose of the same, we proceed to the analysis of social indicators (José Lopez, 2013).

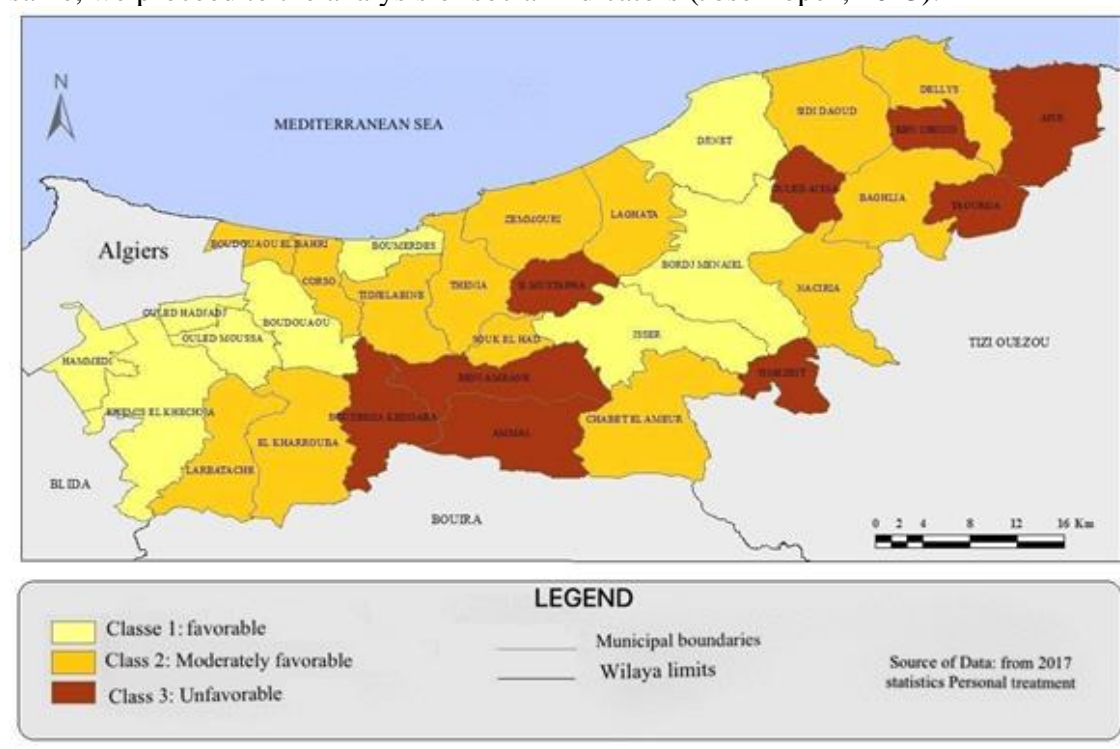


Fig. 04: Synthetic index of the economy

Social parameters, and mainly those related to housing, allow us to assess the living conditions of the population and the comfort of their homes (JEAN, Yve 2020). Besides, housing does not only stand for a consumer good; however, it plays a social role and gives households a status and an identity. As a result, it allows a better integration for these households (Maliki, 2005), upon calculation of the indicator of the housing insecurity rate.

Calculation method

$$PR = HS / PH$$

PR= Precariousness rate / **HS** = The number of housing stock / **PH** = The number of precarious housing.

9.33% of the housing stock of the province is ranked as precarious at the end of 2017.

Housing occupancy rate

Calculation method

$$HOR = HS / Popz$$

HOR = Housing occupancy rate. **HS** = Housing stock. **Popz** = Total population of the concerned municipality.

The HOR of the province is assessed to 4.64 person /house at the end of 2017. Hence, we distinguish three classes:

The **01st class** includes 07 municipalities which are: Boudouaou El Bahri, Ouled Moussa, Ouled Haddadj, Hammadi in the North-West and Khemis El Khechna, Larbaatache, El Kherrouba in the South-West, having a high rate which varies between 5.11 and 6.7. in virtue of which, this is due to the concentration of the urban population.

The **02nd class** comprises 16 municipalities; Boudouaou in the West, Beni Amrane, Souk El Had, Si Mustafa, Zemmouri, Leghata and Bordj Ménaïel in the North Centre; Isser, Timezrit and Chaabet El Ameer in the South, and Sidi Daoud, Dellys, Afir, Ben Choud, Baghlia and Taourga in the East; with a low rate between 3.84% and 5.11%. In virtue of which, we note that there exist municipalities in this class that have a HOR higher than the HOR recorded in the province, in respect such as Souk El Had 4.64% and Sidi Daoud 5.10%.

The **03rd class**: The HOR of this class varies between 5.11% and 6.70% in the municipalities of Boudouaou El Bahri, Ouled Haddadj, Hammadi and Ouled-moussa in the northwest of the province, and Khemis El Khechna, Larbaatache and El Kherrouba in the southwest. Besides, the HOR of this class has shown to be the highest, the fact of which is explained by a high population density.

▪ The indicator of the natural gas connection rate

The GAS connection rate is one of the most important indicators of development and urban planning, which aims at improving the quality of the households' life.

$$TG = PopUtilGas / Popz$$

This reflects the relation between the households using natural gas and the total population of the area in question.

GR = Natural gas connection rate. **Popz** = Total population of the concerned municipality.
Pop Utile Gas = Population using natural Gas.

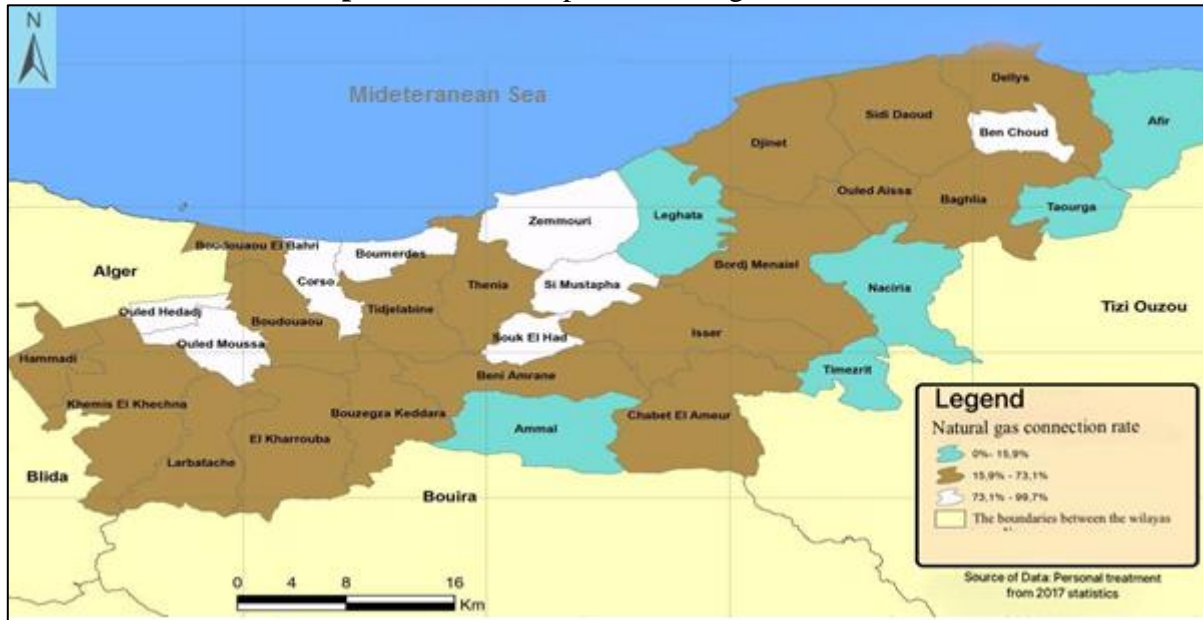


Fig. 05: Natural gas connection rate at the Province of Boumerdes

Source: Directorate of Energy at the Province of Boumerdes

▪ **The index of housing**

$$HI = RCR + RHOR + RPR$$

HI = Synthetic index of the housing. **RCR** = Ranking of gas connexion rate.

RHOR = Ranking of housing occupancy rate. **RPR** = Ranking of Precariousness rate.

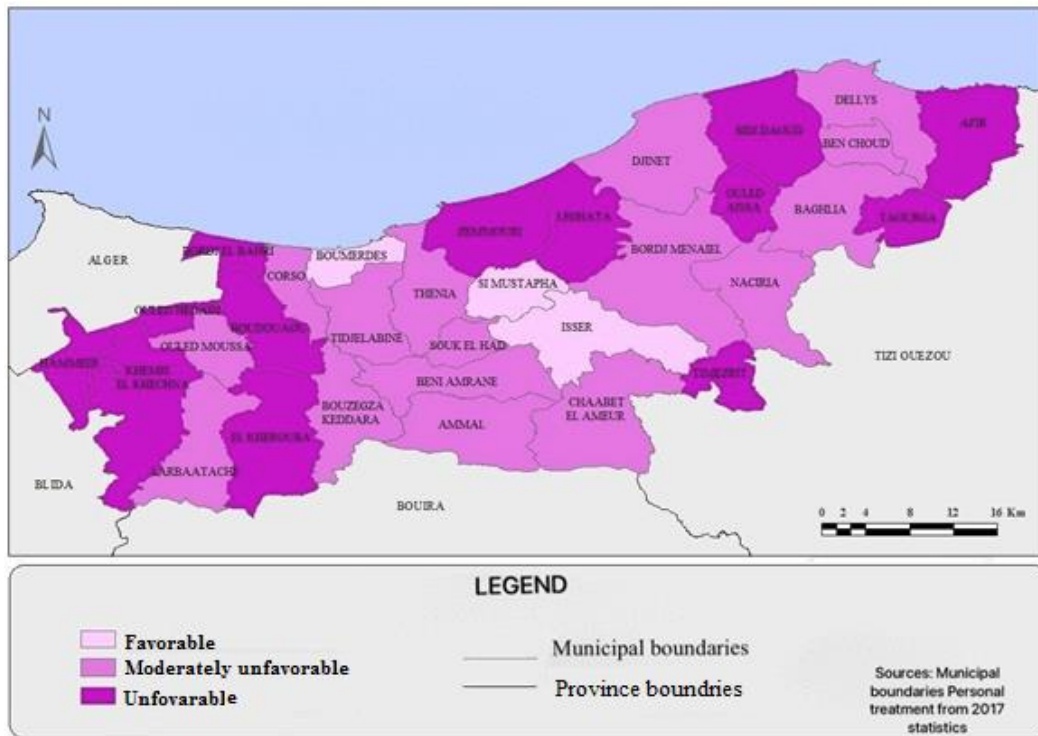


Fig .06: Synthetic index of housing at the Province of Boumerdes

Results and discussions:

In the light of this analysis, we have endeavoured to bring to light the socio-economic inequalities in the Province of Boumerdes, through the Multi-criteria Analysis Method (MCA), all the way through choosing the economic and housing criteria in order to reduce such disparities and to look for better ways for a coherent development of the province.(Figure.07)

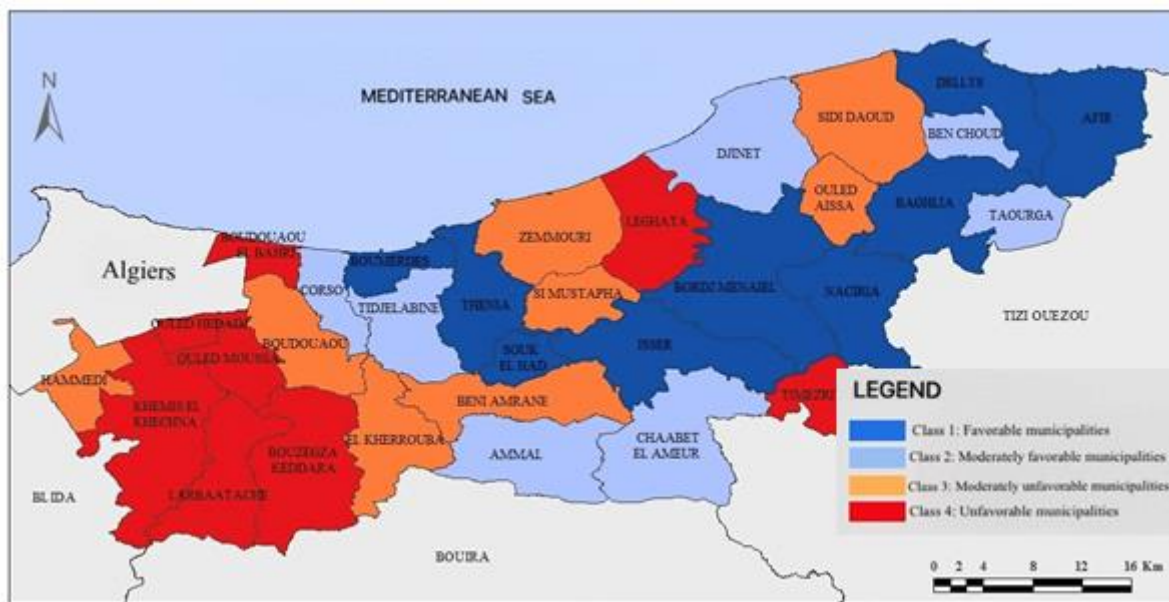


Figure 07: Global index of socio-economic inequality

In reality, these criteria reflect the intrinsic and extrinsic factors at the province, having a direct or indirect relationship with the socio-economic inequalities (Appendix.01). or opposition to the territorial development.

Indeed, the Province of Boumerdes is faced with an economic influence by the effect of metropolization carrying huge potential and immense opportunities, but alike a source of disparity and imbalance. However, it reveals that the impact is always negative. As consequence, the results obtained in this study confirm this observation.

More to the point, the western side of the province, being under the influence of the metropolitan area of Algiers, is marked by the most important equipment and services, the most essential activities and the most profitable industries in this province. Besides, these economic opportunities have shown to be certainly necessary for growth, but as they develop, they generate negative externalities (rural exodus, slumming, etc.) thus reducing the potential for the economic growth and the proper functioning of social structures (housing, health, education, etc.).

Likewise, the South and the extreme East of the province, which share their borders with the provinces of Bouira and Tizi Ouzou, have alike shown to be marked by glaring economic inequalities that are illustrated by a labour market with strong contrasts, with the rise of unemployment and the precariousness of the industrial sector and agriculture. Nonetheless, these delays are caused by the marginalization of rural municipalities and mountain areas, the lack of qualification of human resources, the scarcity of decent jobs and the difficulty of the uneven terrain characterizing the same, which affects the activities being exerted therein, the fact of which has subsequently hindered the economic development in this part of the province. In view of the impacts of inequalities on development, the province of Boumerdes needs particular attention from public authorities and local actors, to be aware of both of its weaknesses and strengths, so as to develop strategies that best fit the characteristics of its territory, thus maintaining disproportions, reducing the impacts of disparities and gaining a coherent and harmonious development (Nicol Jean-Pierre 2007).

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Appendix.01

Table. 02: Recapitulating table of economic and housing criteria (Multi-criteria crossing)

Municipalities	Economic criteria				Housing criteria				Total	Ranking	Classes
	IC				IL				IG		
Boumerdès	16	3	2	21	24	3	2	29	50	1	Favorable
Isser	13	4	27	44	2	10	9	21	65	2	
Djinet	8	9	10	27	17	1	22	40	67	3	
Baghlia	14	15	3	32	4	23	12	39	71	4	
Corso	10	14	4	28	30	7	6	43	71	5	
OuledMoussa	7	7	17	31	6	31	3	40	71	6	
Hammedi	4	8	6	18	11	32	11	54	72	7	
BordjMenaïel	15	2	12	29	16	19	14	49	78	8	
Tidjelabine	16	13	1	30	28	2	18	48	78	9	
Souk El Had	6	28	8	42	13	18	8	39	81	10	Moyennement favorable
Thenia	20	11	5	36	21	5	20	46	82	11	
Boudoua. El Bahri	2	1	20	23	18	26	16	60	83	12	
Si Mustapha	9	27	24	60	8	17	1	26	86	13	
OuledHedadj	3	6	21	30	23	29	4	56	86	14	
Naciria	19	16	9	44	12	9	28	49	93	15	
Chabet El Ameur	22	10	18	50	5	16	23	44	94	16	Moderately unfavorable
Boudouaou	1	22	7	30	27	22	15	64	94	17	
BeniAmrane	22	17	11	50	7	13	26	46	96	18	
Khemis El Khechna	7	5	30	42	3	30	25	58	100	19	
Zemmouri	12	20	14	46	31	20	5	56	102	20	
Ammal	24	25	13	62	9	4	29	42	104	21	
Larbatache	17	18	19	54	1	28	21	50	104	22	
Dellys	18	12	26	56	19	14	19	52	108	23	
BouzegzaKeddara	14	26	29	69	22	6	13	41	110	24	unfavorable
Leghata	5	24	23	52	10	25	27	62	114	25	
El Kharrouba	7	30	16	53	29	27	10	66	119	26	



Afir	20	19	22	61	15	15	29	59	120	27	
SidiDaoud	11	21	25	57	25	24	17	66	123	28	
Ben Choud	17	31	31	79	20	21	7	48	127	29	
Timezrit	23	23	28	74	14	12	29	55	129	30	
Taourga	24	29	15	68	26	11	29	66	134	31	
OuledAissa	21	32	18	71	32	8	24	64	135	32	