The Role Of ANSEJ-Funded SMEs In Achieving Balance And Economic Diversity In Bouira Province

دور المؤسسات الصغير والمتوسطة الممولة من طرف وكالة ANSEJ في تحقيق التوازن والتنوع الاقتصادي على مستوى ولاية البويرة

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ملخص

لا يخفى في الواقع الاقتصادي دور الطرق الكمية في ضبط مؤشرات النشاط الاقتصادي سواء من ناحية تحديد العلاقات من منظور رياضي أو القيام بالدراسات الميدانية والاستشرافية حول بعض الظواهر الاقتصادية، فمن خلال هذه الورقة البحثية حاولنا باستخدام احدى الطرق الكمية التحليلية وهي طريقة تحليل المركبات الاساسية *ACP* والقيام بدراسة تحليلية ميدانية على مستوى عينة نشاط اقتصادي لولاية البويرة لغرض تحديد العلاقات الاقتصادية بين أنواع النشاطات الاقتصادية كالصناعة والزراعة والمهن الحرة من جهة وبين المناخ المناسب لذلك حسب المناطق بأخذ عينة لمجموعة من البلديات وهذا عن طريق المشاريع الممولة بعن طريق وكالات تشغيل الشباب *ANSEJ* حيث بينت الدراسة التطبيقية ارتباط بعض بلديات الولاية بنشاط اقتصادي معين عكس باقي البلديات إذ نجد أن النشاطات الممولة من طرف الوكالة في القطاع الفلاحي ترتكز بالأساس في بلدية عين بسام وسوق الخميس، بينما النشاطات الممولة في القطاع الصناعي ترتكز في بلدية الأخضرية

الكلمات المفتاحية: ولاية البويرة، المؤسسات الصغيرة والمتوسطة، الطرق الكمية، طريقة *ACP*، التنمية.

تصنيف JEL: O18, C02.

Abstract

The economic institutions particularly the Youth Support and Employment Agency, and through funding to conduct economic activities of a peasant or service nature; may have contributed in raising the entrepreneurial awareness as well as motivating youth to work and reducing unemployment. The latter can be achieved mainly by developing ideas and implementing local development through loans directed to youth with postgraduate levels. Accordingly, the researcher has conducted an applied analytical study by analyzing the essential compounds and studying the relationship between the size and type of loans and the various districts of Bouira County. This can be achieved by ascertaining the nature and specificities of each region in yields as well as by determining the youth loans performance on development and activity sectors.

Key words: Bouira County, (SMEs), Quantitative methods, (*PCA*) Method, development.
JEL classification codes: C02 ; O18.

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Introduction:

The Algerian economy is certainly unstable in light of the current conditions of progressive decrease in fossil fuel prices, whose revenues have been the main financial inventory of the economy. Additionally, this continuous decrease has affected the overall national economic activity as well as local activities. Thus, catalyzing economic enterprises' activity may be necessary to create self-wealth and internal investments that can provide internal economic balance.

The economic enterprises particularly the Youth Support and Employment Agency, and through funding to conduct economic activities of a peasant or service nature may have contributed in raising the entrepreneurial awareness as well as motivating youth to work and reducing unemployment.

The latter can be achieved mainly by developing ideas and implementing local development through loans directed to youth with postgraduate levels. Accordingly, the researcher has conducted an applied analytical study by analyzing the essential compounds and studying the relationship between the size and type of loans and the various districts of Bouira County.

This can be achieved by ascertaining the nature and specificities of each region in yields as well as by determining the youth loans performance on development and activity sectors; in addition to the impact of these loans on the path of local development in the fields of agriculture, services and handicraft industries specific to Bouira County.

I- The use of PCA method in assessing ANSEJ-Funded SMEs conditions of Bouira County:

SMEs can be considered a support instrument for the national economy in general and for local economy in particular; due to the overlap between many factors including the owner of the enterprise, the external environment and other factors. Hence, the role of ANSEJ in supporting youth can be highlighted in founding and financing their SMEs within the framework of convention between the parties. Therefore, the researcher has examined the conditions of ANSEJ-Funded SMEs and identified the chief common characteristics of the different projects funded; according to the sector and to the project management service depending on the available data for the year 2018.

The central idea of *Principal Component Analysis* (PCA) is to reduce the dimensionality of a data set consisting of a large number of interrelated variables, while retaining as much as possible of the variation present in the data set. This is achieved by transforming to a new set of variables, the principal components (PCs), which are uncorrelated, and which are ordered so that the first few retain most of the variation present in all of the original variables (Jolliffe, 2002).

Principal Component Analysis (PCA) is a well-established tool for making sense of high dimensional data by reducing it to a smaller dimension. It has applications virtually in all areas of science machine learning, image processing, engineering, genetics, neurocomputing, chemistry, meteorology, control theory, computer networks -*to name just a few*- where large data sets are encountered. It is important that having reduced dimension, the essential characteristics of the data are retained. If $A \in R^{p \times n}$ is a matrix encoding p individuals of n variables, with n being large, PCA aims at finding a few linear combinations of these variables, called principal components, which point in orthogonal directions explaining as much of the variance in the data as possible (Journée, Nesterov, Richtàrik, & Sepulchre, 2010).

Besides, nine common sectors have been analyzed in sectors of agriculture, manufacturing, handicrafts, construction and irrigation, services, entrepreneurial, etc., distributed across the various municipalities of Bouira County. After the application of *Principal Component Analysis* (*PCA*) method using a software program (*Xlstat 2017*), the researcher has arrived to the following:

I-1 Number of axes opted for interpretation

In order to determine the number of axes opted for interpretation in the current study, the researcher has calculated the eigenvalues and eigenvectors in order to plan the axes of the "factorial design" that represent individuals and variables.

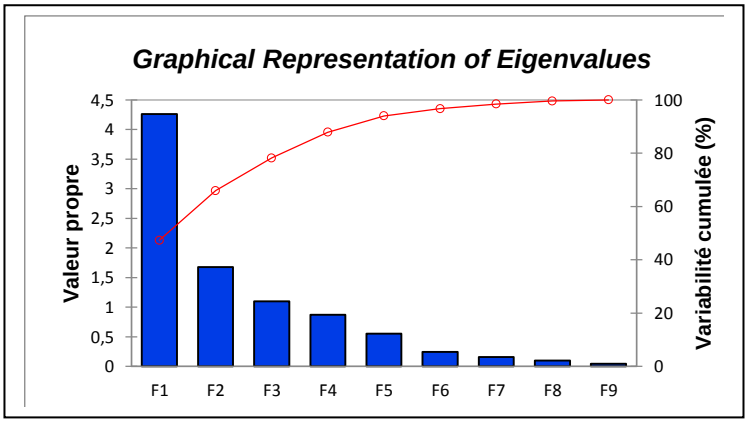
The cumulative variance and the Kaiser's rule were applied in order to know how many components to retain that considers eigenvalues larger than one ($\lambda_i > 1$)) (Pasini, 2017).

Table n°1: *The Eigenvalue and Cumulative Variance*

PC_S	*Eigenvalues*	*Cumulative Variance (%)*
PC_1	4,25	47,32
PC_2	1,67	65,94
PC_3	1,1	78,16
PC_4	0,87	87,83
PC_5	0,55	93,95
PC_6	0,24	96,64
PC_7	0,16	98,41
PC_8	0,1	99,52
PC_9	0,04	100

Source*: Xlstat Program Outputs*

Figure n°1: *The Eigenvalue and Cumulative Variance*



Source*: Xlstat Program Outputs*

The eigenvalue is then **(λ_1=4,259)** for the first principle component **(PC_1)**, which explains the **47,323 %** of the total variance; in addition to eigenvalues of the principle component **(PC_2, PC_3)** that respectively equal **(λ_2=1,676, λ_3=1,100)** with the percentages of **12,217%, 18,620%**. Thus, the researcher will directly analyze and interpret the dimensional point cloud of variables and individuals on the levels (PC_1, PC_2); in the method a percentage of ***65.944%*** has been chosen. The result is that retaining two principal components is enough to explain most of the total variation, Hence, the factorial design space IR^2 of two axes.

I-2- Variables' Principle Components on Axes

After identifying unitary correlation matrix's eigenvectors together with its eigenvalues, the researcher has calculated the variables coordinates on the factorial axes as shown in the following table:

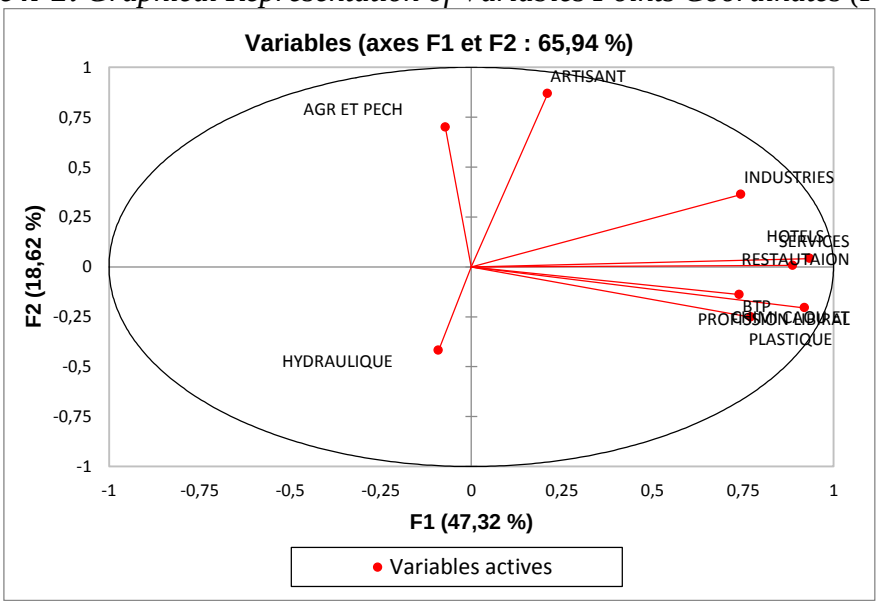
Table n°2: *Variables' Principle Components on Axes*

	PC_1	PC_2
Agriculture	-0,072	0,700
Handicrafts	0,211	0,868
Public works	0,740	-0,139
Plastic industry	0,772	-0,252
Hotel industry	0,887	0,007
Construction and irrigation	-0,091	-0,418
Manufacturing	0,744	0,362
Entrepreneurial	0,920	-0,205
Services	0,934	0,042

Source*: Xlstat Program Outputs*

Accordingly, the researcher has graphically presented the variable points as the following:

Figure n°2: *Graphical Representation of Variables Points Coordinates (F1, F2)*



Source*: Xlstat Program Outputs*

Based on Figure 2 representation**,** two groups of homogenous variables can be identified. The first group (Public works, plastic industry, hotel industry, manufacturing, and services) represents the first factorial axis PC_1 respectively with the percentages of (**12,845%, 13,980%, 18,493%, 12,999%, 19,854%,** and **20,473%**). Yet, the second group (Agriculture, handicrafts, and construction and irrigation) represents the second factorial axis PC_2 respectively with the percentages of (**29,258%, 44,916%,** and **10,442%)** that is confirmed by the cos^2 values. Hence, the first group (Public works, plastic industry, hotel industry, manufacturing, Entrepreneurial and services) and respectively with the values (**0,547, 0, 595, 0,788, 0,554, 0,846,** and **0,872**) appropriately represents the first factorial axis PC_1 because all values are close to one.

I-3- Interpretation of Linear Correlation Coefficients

Based on the above Figure 2 presentation and depending on the confined angles between variables as well as the correlation matrix displayed as the following:

Table n°3: *Correlation Matrix for Variables*

	Agriculture	Hand Crafts	Public Works	Plastic Industry	Hotel Industry	Construction & Irrigation	Manufacturing	Entrepreneurial	Services
Agriculture	**1**	0,423	-0,098	-0,060	0,128	-0,233	-0,093	-0,102	-0,189
Handicrafts	0,423	**1**	0,021	-0,114	0,148	-0,122	0,532	-0,036	0,305
Public Works	-0,098	0,021	**1**	0,470	0,667	-0,046	0,429	0,631	0,580
Plastic Industry	-0,060	-0,114	0,470	**1**	0,667	-0,097	0,343	0,788	0,650
Hotel Industry	0,128	0,148	0,667	0,667	**1**	-0,014	0,514	0,855	0,741
Construction & Irrigation	-0,233	-0,122	-0,046	-0,097	-0,014	**1**	-0,151	-0,049	-0,009
Manu-facturing	-0,093	0,532	0,249	0,343	0,514	-0,151	**1**	0,522	0,829
Entrepreneur-ial	-0,102	-0,036	0,631	0,788	0,855	-0,049	0,522	**1**	0,826
Services	-0,189	0,305	0,580	0,650	0,741	-0,009	0,829	0,826	**1**

Source*: Xlstat Program Outputs*

It can be concluded that the confined angle between (services and entrepreneurial) and (services and manufacturing) is an acute angle (approaching zero). As a consequence, the results indicate that there exists a significant positive correlation between the two groups, i.e., $(\cos^2\theta(\theta \simeq 0)) \simeq 1$. For instance, the degree of correlation between services and entrepreneurial that approaches **0,826.** Consequently**,** this indicates that most of the ANSEJ-Funded projects of a service nature fall primarily in the entrepreneurial sector.

Moreover, right angles or semi-right angles suggest that there exist either no correlation or insignificant correlation between variables. $(\cos^2\theta(\theta \simeq \pi/2)) \simeq 0$ This can be clearly observed between handicrafts and public works sectors with **0,021.**

Furthermore**,** obtuse angles indicate that there is a negative correlation between variables, i.e., $(\cos^2\theta(\theta \simeq \pi)) \simeq -1$. For example, the degree of correlation between agriculture and entrepreneurial is **-0,102.**

I-4- Individuals' Principle Components on Axes

After identifying unitary correlation matrix's eigenvectors together with its eigenvalues, the researcher has calculated the variables coordinates on the factorial axes as shown in the following table:

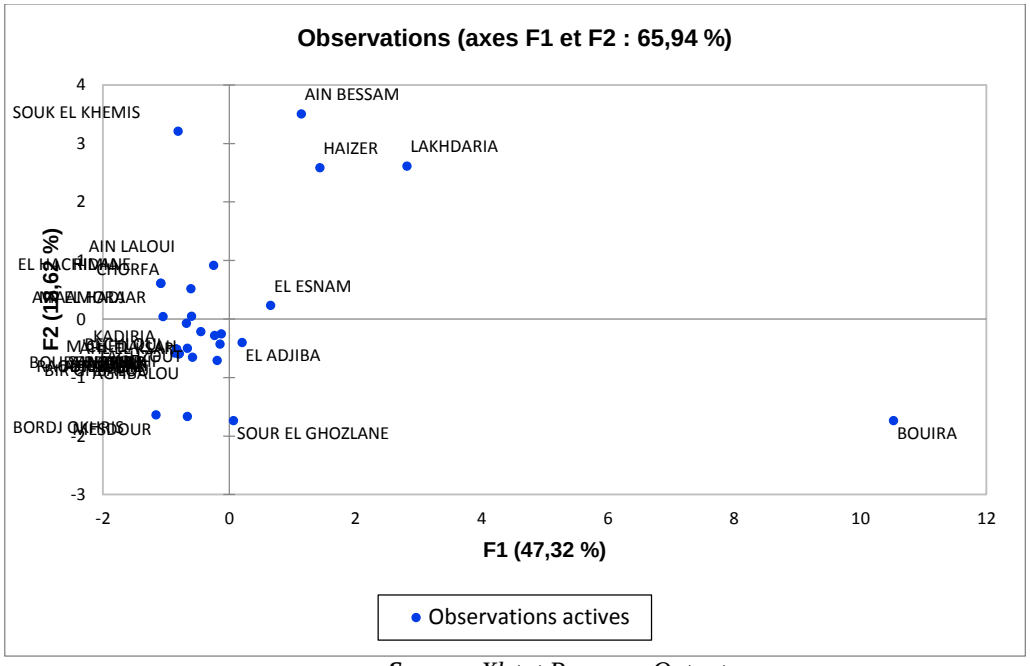
Table n°4: *Individuals' Principle Components on Axes*

	PC_1	PC_2		PC_1	PC_2
Bouira	10,531	-1,743	Djebahia	-0,792	-0,597
Ait laziz	-0,792	-0,597	Bordj Okhriss	-1,158	-1,641
Ain Turk	-0,833	-0,520	Mezdour	-0,659	-1,670
Haizer	1,439	2,577	Lakhdaria	2,822	2,610
Taghzout	-0,142	-0,433	Bouderbala	-0,833	-0,520
Bechloul	-0,446	-0,221	Bir Ghbelou	-0,576	-0,662
El-Adjiba	0,207	-0,408	Raouraoua	-0,792	-0,597
Ahl El ksar	-0,231	-0,285	Ain Bessem	1,148	3,497
El-Asnam	0,659	0,226	Ain Laloui	-0,246	0,912
M'Chedallah	-0,121	-0,262	Ain El hadjar	-0,596	0,043
Saharidj	-0,833	-0,520	Souk El khemis	-0,808	3,202
El-Chorfa	-0,406	0,511	El-Hachimia	-1,080	0,606
Aghbalou	-0,187	-0,714	Sour El Gouzlane	0,069	-1,739
Ahnif	-0,658	-0,508	Ridane	-1,080	0,606
Kadria	-0,677	-0,081	Maamora	-1,043	0,037
Aomar	-0,833	-0,520	Dirrah	-0,856	-0,586

Source*: Xlstat Program Outputs*

Accordingly, the researcher has graphically presented the variable points as the following:

Figure n°3: *Graphical Representation of Variables Points*

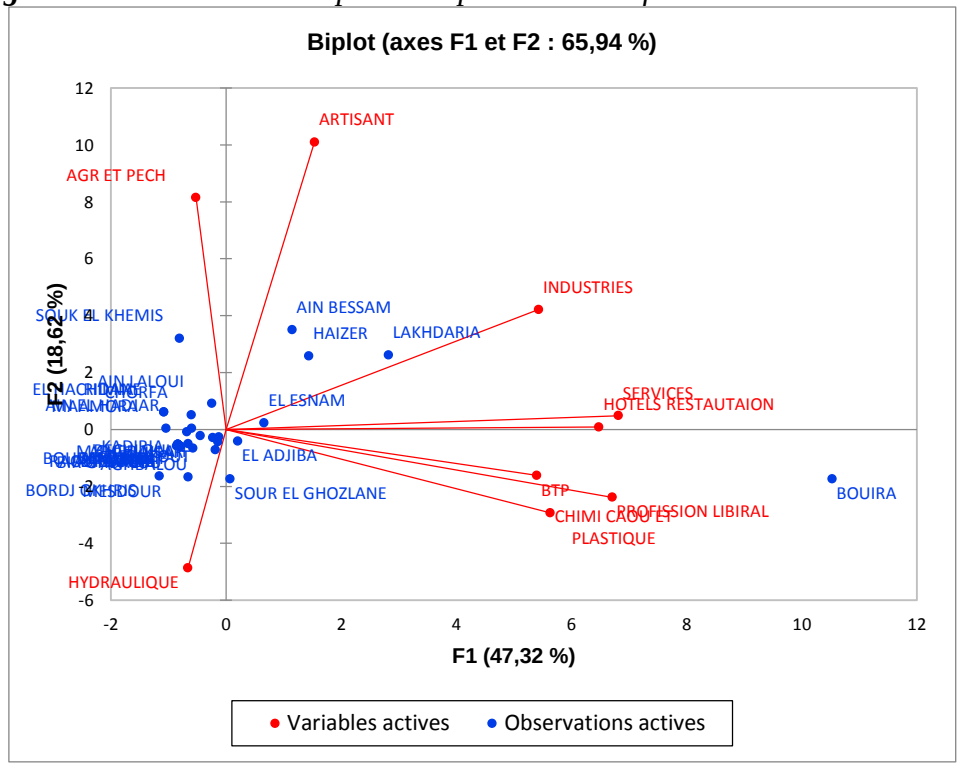


***Source**: Xlstat Program Outputs*

Based on Figure 3 representation**,** three groups can be identified. The first group (Bouira municipality) represents the first factorial axis PC_1 with the percentage of (**81,365%**). Yet, the second group (the municipalities of Haizer, Lakhdaria, Ain Bessem and Souk El khemis) represents the second factorial axis PC_2 respectively with the percentages of (**12,385%, 12,700%, 22,809** and **19,119%)** that is confirmed by the cos^2 values. Hence, the first group (Bouira municipality) with the value (**0,961**) appropriately represents the first factorial axis PC_1 because its value is close to one. However, the third group includes the remaining districts that represent the remaining factorial axes.

I-5- First Level Graphical Representation of Variables and Individuals

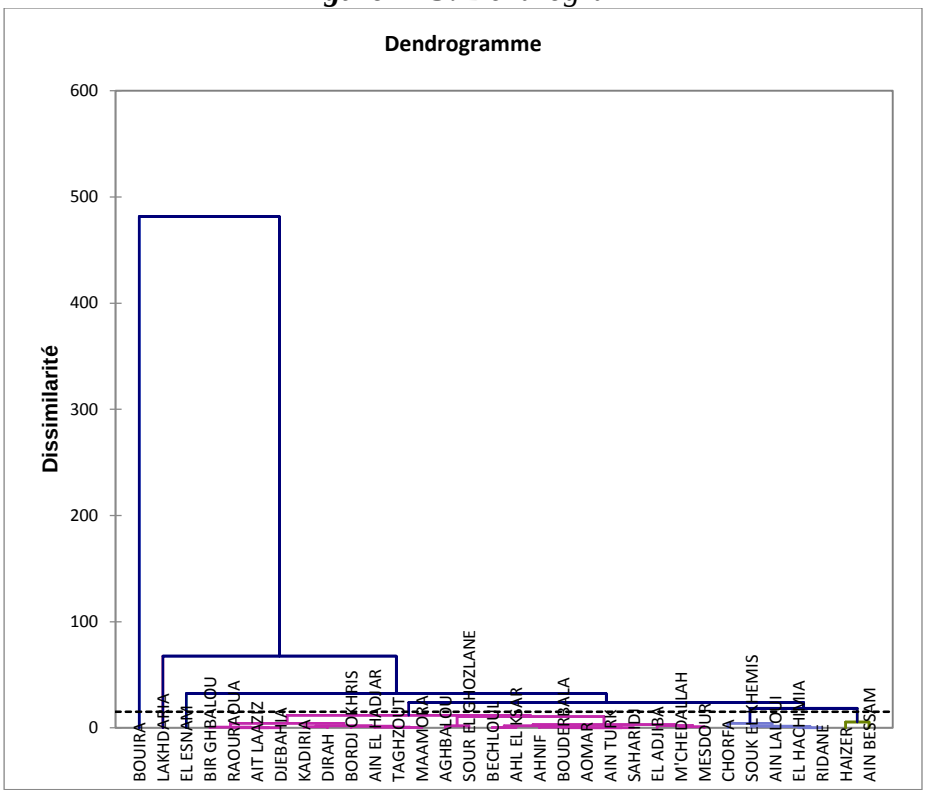
***Figure n°4:** First Level Graphical Representation of Variables and Individuals*

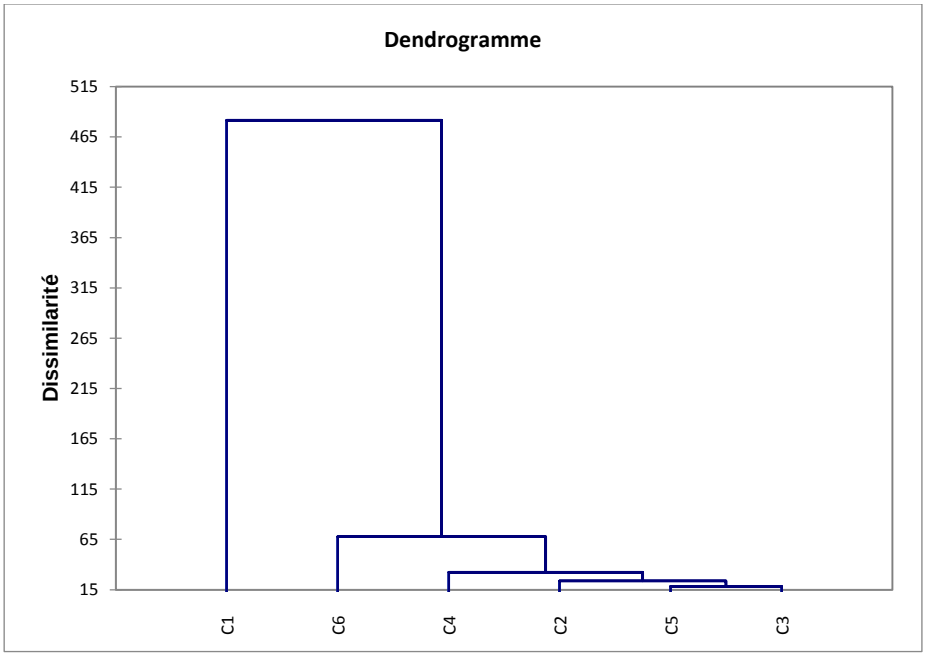


***Source**: Xlstat Program Outputs*

Based on Figure 4 representation and the obtained results, it can be concluded that most ANSEJ-Funded projects for the year 2018 are projects related to manufacturing, services, hotel industry, public works, plastic industry, and entrepreneurial sectors; additionally, they are concentrated in the municipality of Bouira. However, the ANSEJ-Funded projects in the municipalities of Haizer, Lakhdaria, Ain Bessem, El-Asnam and Souk El khemis are projects funded in three sectors; primarily manufacturing that is concentrated in the municipality of Lakhdaria; secondarily, the handicraft and construction and irrigation sectors, which are concentrated in the municipalities of Ain Bessem, El-Asnam and Haizer. Yet, ANSEJ-Funded projects in the agricultural sector are greatly concentrated in the municipalities of Souk El khemis, Ain Laloui, El-Hachimia, and El-Adjiba. Nonetheless, construction and irrigation sector is concentrated in the municipalities of Sour El Gouzlane and Bordj Okhriss. As a result, n the following dendrogram, which is a tree representation of data used in hierarchical cluster analysis. However, the difficulty of the current analysis is the enumeration of non-isomorphic dendrograms with specified numbers of terminal or leaf nodes. Sub-classes difficulties are identified; arising out of whether or not a dendrogram is considered to be binary, labeled and ranked (Murtagh, 1984), and results are reviewed for each:

Figure n° 5: *Dendrogram*





***Source**: Xlstat Program Outputs*

The dendrogram illustrates the formation of six groups:

The first group: It includes the municipality of Bouira, where service sector and hotel industry are of good quality. Moreover, as a capital of the county, this encourages investment in the named sectors at the level of Bouira.

The second group: This includes the Municipality of Lakhdaria, which is of an industry character owing to ANSEJ-funded projects.

The third group: It includes the municipality of El-Asnam, which most of its ANSEJ-funded activities focus on handicrafts, construction and irrigation sectors.

The fourth group: It includes both municipalities of Ain Bessem and Haizer that involve the handicrafts sector. This contributes significantly in developing tourism sector for Bouira County as a whole.

The Fifth group: this includes the municipalities that share ANSEJ-funded projects in the agricultural sector; namely the municipalities of Souk El khemis and Ain Laloui of Ain Bessem districts. The latter is located on Hamza Plain agricultural lands, which is characterized by its vastness and fertility; in addition to the cultivation of important crops such as grains particularly wheat and barley as well as vegetables mainly potatoes. Additionally, it includes the municipalities of El-Hachimia, the El-Chorfa and El-Adjiba, which are characterized by their peasant character due to a range of agricultural activities such as poultry and livestock raising; in addition to some important crops such as cereals and fruits.

The sixth group: It is made up of the rest of the municipalities and which share the fact that their funding ratio is weak and focused on the construction and irrigation sector.

II. Conclusion

Based on the application of PCA method on ANSEJ-Funded SMEs' projects in Bouira County; in addition to the division of funded projects according to its districts for the year 2018, the findings show that the funded projects of services are significantly linked to the entrepreneurial sector and are restricted to Bouira districts. As a capital of the county, Bouira is characterized by service-based sectors due to the need of necessary service facilities. Furthermore, the results indicate that the agricultural sector is the most explanatory variable for individuals in Lakhdaria. This is due to the peasant nature of Ain Bessem district, such as the cultivation of vegetables particularly potatoes. In addition to Lakhdaria district that concentrates on livestock and poultry breeding. Then followed by the industry sector variable explained by individuals of Bouira and M'Chedallah districts; however, with a decreased

financing ratio. Lastly, the results show that the remaining districts are confined in one group; where the financing ratio is probably decreased and distributed over several sectors in varying percentage.

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