

# Classification of Mali Regions According to Socio-economic and Demographic Indicators

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**Abstract** This article classifies the Regions of Mali by the ranking method based on data from the 2013 statistical yearbook of the Institute National of Statistic (INSTAT) and the Fourth General Population and Housing Census (GPHC, 2009). This classification distinguishes 3 main groups. It has been found that some regions excel in certain economic sectors, hence the importance of having this information to better design medium- and long-term economic development policies. Deficiencies in socio-demographic indicators have been identified in almost all regions.

**Keywords:** classification, regions, indicators, scores, rank

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## 1. Introduction

With a density of nearly 11 inhabitants per square kilometer, the Republic of Mali, an agro pastoral country, has been divided since the events of the late 1980s and early 1990s into eight administrative regions plus a central district (two new regions in the north have just emerged). A unitary state highly centralized by its governance because almost all the directors are appointed from the capital, its business card is not very shining nowadays: recurrent security crisis since independence, dependent economy and especially very little diversified (gold, cotton and livestock constitute 85% of exports in 2013 [1]), high unemployment rate in cities (especially among young people and women), soaring and relatively uncontrolled demography, insufficient and poor quality health coverage rate, and so on. Since the end of 2011, the country has been in a serious and unprecedented crisis that has led near to its partition between North and South. The so-called Algiers Agreement should put an end to this situation by creating the conditions for a just and lasting peace. This agreement, if it applies, in Articles 5 and 8 confers on the regions powers formerly reserved for the central power, which will lead us to a federal state (the regions being federal subjects enjoying a certain autonomy). Thus, Article 5 of the Agreement stipulates that the regions are competent, within a general framework defined in advance by law and regulation, in the following areas [9]:

a) economic, social and cultural development plan and program;

- b) spatial planning ;
- c) creation and management of public facilities and basic social services (basic education and vocational training, health, environment, culture, road and communication infrastructure in the regional domain, energy, water and sanitation);
- d) agriculture, livestock, fisheries, forest management, transport, trade, industry, crafts, tourism, interregional transport;
- e) regional budgets and administrative accounts;
- f) establishment and application of taxes and own revenues on the basis of parameters determined by the State;
- g) royalties institutions;
- h) acceptance and refusal of donations, grants and legacies;
- i) granting of grants;
- j) equity investments;
- k) decentralized cooperation and twinning;
- l) territorial police and civil protection.

This "quasi-federalization" of the country or even called "advanced regionalization" leading in the medium and long term to transfers of competences to regions and municipalities, will require the latter at almost all levels (administrative, political, cultural, economic) to highlight their assets to achieve the objectives of socio-economic development in an atmosphere of competition (between federal subjects to have the best possible indicators) and complementarity. Highlighting the potential of the regions enables the State to better develop its economic policy programs such as the establishment and development of Special Economic Zones (SEZ).

## 2. Study Objective and Methodology

Through this work, the authors aim to highlight the potential of the different regions of the country in order to focus on them both at the level of the elaboration of general State policy and at the municipal (regional) level. We will also try to find possible correlations between certain indicators and between these indicators and the places occupied by municipalities.

The methodology used is the classification of the country regions by arrangement of indicators. At present, the country has eight administrative regions plus one autonomous district. We will focus much more on the regions because the district is an exception (difficult to compare with other municipalities for several reasons). So since we have eight regions, arbitrarily we will assign points on a scale of one to eight. Thus, a region ranked first in a given indicator gets eight points and a region ranked eighth gets one point. And then we add up the points obtained to make a classification according to the field studied. We will end with a general classification.

The data used in this study come mainly from [2,3,7,8].

## 3. Demographic Classification

Our first object of classification concerns certain demographic data as shown in Table 1 (Annex). Mali's population at the end of 2013 is estimated at 14.5 million inhabitants. Like most developing countries, it is characterized by: its youth (46.6% of the total population under 15 years), its high fertility rate (on average 6.6 children per woman of childbearing age), its crude birth rate and mortality rate estimated at 43.9‰ and 12.5‰ respectively, its low urbanization rate (22%), its literacy rate (27.7%), its estimated life expectancy at birth of 53 years in 2012 [13], its nominal gross domestic product (GDP) per capita is \$2,428.3 and its average Human Development Index (HDI) at 0.399, ranking 175th out of 187 countries in 2013.

The sum of the points awarded to the different regions by the method described above, makes the Sikasso region our first leader. Indeed, it has 25 points out of 32 possible with its first two places in terms of population and number of households and its third place among city dwellers. In other words, the Sikasso region is the most populated region in Mali and has the largest number of households.

However, it is relatively less urban. With 21 points out of a possible 32, the regions of Segou and Koulikoro are in second place. Here, the equality of the sum of the indicators does not mean that these two regions are equal. In fact, a comparative study of indicators in the two regions indicates that the Koulikoro region is more populated than the Segou region, despite its lower number of households. These regions, in addition to being among the most populated, have the particularity of being agrarian zones par excellence. They occupy the front and last places respectively in terms of urbanization rates. Mopti with 20 points is in fourth place in this ranking followed by the Kayes region (17 points). Timbuktu the largest region in area 497,926 km<sup>2</sup> [12] (it has just been divided into two regions) is sixth followed by Gao 13 points (also divided into two regions). The Kidal region, the second largest in the country (260,000km<sup>2</sup> [11]), is in eighth place in our ranking. These three regions are relatively more urbanized than the others. Kidal urbanization rate is even above the national average (38.3% compared to 22.2% at the national level). The relatively low population of the last three regions and their higher level of urbanization compared to the other regions are attributable to the climatic conditions of the Sahara.

## 4. Social Indicators

### 4.1. Health Status

Table 2 (Annex) below provides some information on health indicators. At the end of 2013, there were 1,134 community health centers (CHC) in the country, which constitute the first level of the health pyramid for a total of 703 municipalities. This represents an average of 1.6 center per commune and 12,812 inhabitants per center. The average number of inhabitants per doctor is estimated at 13,096 and the average number of inhabitants per doctor is 4,163. 762 cases of measles have been recorded throughout the country, more than half of which are in the Gao and Kidal regions. The district of Bamako is the most affected city in the country with 158 cases. It also ranks last with more than 57% of all meningitis cases in the country. The Koulikoro region with 118 cases is on the heels of the capital. It should also be noted that the three regions most affected by malaria are also those most affected by malnutrition.

Table 1. Mali regions according to some demographic data

	Population		Households		Urban population		Rural population	
	Number of people	Rank	Number of people	Rank	%	Rank	%	Rank
Kayes	1,993,615	5	305,742	5	11.6	5	88.4	4
Koulikoro	2,422,108	2	365,446	4	5.5	8	94.5	1
Sikasso	2,643,179	1	406,774	1	16.1	3	83.9	6
Segou	2,338,349	3	387,688	2	8.6	7	91.4	2
Mopti	2,036,209	4	378,752	3	9.8	6	90.2	3
Timbuktu	674,793	6	121,662	6	13.0	4	87.0	5
Gao	542,304	7	90,205	7	21.0	2	79.0	7
Kidal	67,739	8	12,643	8	38.3	1	61.7	8
Bamako	1,810,366	-	286,381	-	100.0	-	0.0	-
<b>Total</b>	<b>14,528,662</b>	-	<b>2,355,293</b>	-	<b>22.2</b>	-	<b>77.8</b>	-

Source: Authors' calculations based on data from the Statistical Yearbook.

**Table 2. Some health indicators for Mali regions in 2013**

	Functional CHC		Inhabitants/ doctor		Women of childbearing age/midwife		Inhabitants/Nurse	
	Number of people	Rank	Ratio	Rank	Ratio	Rank	Ratio	Rank
Kayes	199	2	17,357	6	9,677	7	5,626	7
Koulikoro	184	4	21,425	8	10,130	8	7,295	8
Sikasso	208	1	18,556	7	12,608	9	4,766	5
Segou	188	3	16,012	5	8,708	6	5,149	6
Mopti	151	5	24,859	9	6,671	5	7,859	9
Timbuktu	71	6	14,302	4	6,555	4	3,867	4
Gao	65	7	10,322	3	4,605	3	2,247	3
Kidal	11	9	4,750	2	2,291	2	1,134	1
Bamako	57	8	4,361	1	1,056	1	1,631	2
Total	1,134	-	13,096	-	4,336	-	4,163	-
	Suspected cases of measles		Cases of meningitis		Malaria prevalence		Malnutrition rate	
	Ratio	Rank	Ratio	Rank	%	Rank	%	Rank
Kayes	25	3	16	5	12.03	7	0.93	9
Koulikoro	31	4	118	8	11.31	6	0.79	6
Sikasso	34	5	40	7	14.46	9	0.83	7
Segou	14	1	3	3	10.21	5	0.83	7
Mopti	51	6	18	6	8.08	4	0.59	5
Timbuktu	17	2	2	2	7.35	3	0.48	4
Gao	286	9	9	4	5.49	1	0.00	1
Kidal	146	7	0	1	6.97	2	0.00	1
Bamako	158	8	282	9	13.43	8	0.33	3
Total	762	-	488	-	10	-	0.53	-

Source: Authors' calculations based on data from the Statistical Yearbook.

Thus the Kidal region occupies the first place in this group of indicators with 54 points out of 72 possible. With 3 remarkable first places, she is ahead of Timbuktu and her 51 points. Gao is in third place (49 points) ahead of Ségou (44 points) and the Bamako district (40 points). The most remarkable finding in this ranking is that the top leaders according to demographic indicators, namely the Koulikoro and Sikasso regions, become the last ones.

## 4.2. Education and Literacy

National education other than higher education is our third element of classification. The higher level is generally replaced by the literacy rate, which is defined as the ability of a person aged 15 years and over to read and write in any language. In Mali, only 28 out of 100 people

are literate in 2013. Apart from the district of Bamako, only the Kidal region has statistics above the national average (nearly 29% of people are literate).

In Table 3 (Annex), the Koulikoro region ranks first in this category except for the capital. She has a total score of 35 out of 45 possible points. The literacy rate in the region is very close to the national average. Its proximity to the district (which it also includes) is most likely the major explanation for this mini performance. With only 25% of its population aged 15 and over able to read and write, the Sikasso region ranks second (32 points). The regions of Mopti (15 points), Timbuktu (16 points) and Gao (14 points) occupy the last three places in this category. Timbuktu and Kidal have the particularity of having the two best average pupil/teacher ratios (32 and 25 respectively) and the lowest enrolment and attendance rates.

**Table 3. Some education indicators by region of Mali in 2013**

	Gross enrolment ratio (7-12 years old)		Gross attendance rate (13-15 years old)		Gross attendance rate secondary		Average number of students per teacher		Literacy rate (15 years and over)	
	%	Rank	%	Rank	%	Rank	Ratio	Rank	%	Rank
Kayes	74.5	4	35.9	5	13.1	6	40	5	20.8	6
Koulikoro	84.5	2	50.4	2	25.5	2	42	6	27.6	3
Sikasso	77.4	3	41.9	3	21.2	3	37	4	24.0	5
Segou	71.2	5	41.1	4	18.2	4	42	6	24.6	4
Mopti	53.0	6	25.6	7	11.4	7	42	6	17.5	9
Timbuktu	30.7	8	22.5	8	10.8	8	32	2	18.4	8
Gao	14.5	9	29.2	6	16.8	5	58	9	21.9	7
Kidal	37.0	7	20.2	9	10.3	9	25	1	28.6	2
Bamako	86.0	1	80.8	1	65.3	1	35	3	55.7	1
<b>Total</b>	<b>71.0</b>		<b>44.0</b>		<b>25.8</b>		<b>39</b>		<b>27.7</b>	

Source: 4th GPHC-2009.

## 5. Economic Indicators

### 5.1. Agriculture

Cereal production is the next step in this study. [Table 4](#) (Annex) shows the lack of information for the Kidal region and the Bamako district. For the Kidal region, it is due to the crisis that the country has been going through since 2012. It should be noted that production concerns food crops such as small millet, sorghum, rice, corn, wheat and finally fonio. For a total cereal production of more than 5.7 million tons on a total area estimated at more than 3.6 million hectares, the average yield is rather low, certainly due to the agricultural sector's excessive dependence on climatic conditions.

Thus, out of the three indicators, Ségou comes first with a score of 20 out of 21. But Timbuktu has outperformed all other regions in terms of productivity. It is the only one to exceed two tons per hectare. This is partly due to the cultivation of wheat, 96% of the country's total harvest comes from the region. Despite this relatively good performance, Timbuktu is only fourth in this ranking with 11 points. Sikasso is the second behind Segou with a total production estimated at 1,695,290 tons of cereals. Nearly 66% of this production is corn, wheat not being cultivated at all. The third is the Mopti region, whose most harvested crops are rice (26% of national production) and small millet (nearly 31% of the total country), second only to Segou with 55% and 35% of total production respectively. Koulikoro is the fifth (10 points) followed by Kayes and Gao respectively 7 and 6 points. Koulikoro ranks second in corn (248,271 tons) and sorghum (2,734,883 tons) cultivation behind Sikasso. Kayes, which has the lowest yield (less than one ton/hectare), nevertheless occupies an honorable fifth place in total production, unlike Gao, which has the smallest production (1.2%) of the whole.

### 5.2. Breeding

Livestock ([Table 5](#), Annex) occupies an important place both in the lives of ordinary citizens and in the national economy. For some as well as for the Fulani, Arab and Tuareg herders, it is a source of wealth and their whole life revolves around it. For the others (the sedentary) it is widely used in rural and domestic work, hence the low level of mechanization of the country's agriculture.

The analysis of [Table 5](#) allows us to obtain the following ranking: Mopti 53 points, 50 for Koulikoro, 48 for Timbuktu, Gao with 46 points followed by Segou 42, Kayes 40, Kidal 35 and finally Sikasso and Bamako respectively 34 and 16 points. It can be seen from this table that livestock farming is very diversified throughout the country, unlike agriculture, whose total cereal production comes essentially from the three regions that are: Sikasso, Segou and Mopti. However, there are some particularities to be noted. It is about:

- the predominance of the Gao region in the breeding of small ruminants (6.5 million head);
- Kidal, the undisputed leader in camel farming with 517,880 heads, more than half of the country as a whole;
- Kayes and Timbuktu abounding 53% of the country's equines;
- the total absence of pig breeding in the Timbuktu, Gao and Kidal regions, while Koulikoro (32,589 heads) and Segou (30,503) are the leaders with 81% of the workforce;
- Bamako district with 16% of the poultry population, more than all the regions: Timbuktu, Gao and Kidal;
- Mopti having more cattle than Timbuktu, Gao, Kidal and Bamako combined (28% of the national workforce).

### 5.3. Dairy Industry

The quantity of milk produced ([Table 6](#), Annex) by all cattle, small ruminants and camels (43,854,277) is estimated at 1,579 tons. By species, camel production is the highest at 472 tons, or an average of 482 liters of milk per animal. Cattle are in second place (442 tons) followed by goats (387 tons). By region, Kidal is the most productive (329 tons), in second place we have Gao 279 tons and Mopti in third position 257 tons. Camelina milk production is higher in the three northern regions compared to other animals. However, this milk remains relatively unknown in the rest of the country, with the exception of the said regions.

From [Figure 1](#), it appears that the Kidal region produces 21% of the national milk production, Gao 18%, 16% for Mopti and 15% for Timbuktu. Bamako's production is practically zero. This is due to the fact that the district's apparent production is attributable to the Koulikoro region. Most of the milk production in its eastern surroundings comes from certain communes of Koulikoro.

**Table 4. Cereal production, area and yield by region in 2013**

Regions	Production		Surface area		Yield	
	Tons	Rank	Hectares	Rank	Tons/ha	Rank
Kayes	234,241	5	259,206	5	0.904	7
Koulikoro	735,800	4	628,633	4	1.170	6
Sikasso	1,695,290	2	975,866	2	1.737	3
Segou	1,847,016	1	1,006,609	1	1.835	2
Mopti	967,484	3	656,186	3	1.474	5
Timbuktu	188,713	6	91,235	6	2.068	1
Gao	67,548	7	43,253	7	1.562	4
<b>Total</b>	<b>5,736,092</b>		<b>3,660,988</b>		<b>1.567</b>	

Source: Authors' calculations based on data from the Statistical Yearbook

**Table 5. Livestock numbers (in thousand heads) by species and region as at 31 December 2013**

	Cattle		Sheep		Goats		Equines	
	Number of employee	Rank	Number of employee	Rank	Number of employees	Rank	Number of employees	Rank
Kayes	1,066	5	1,591	5	1,610	7	167	1
Koulikoro	1,437	3	1,147	7	2,029	5	88	3
Sikasso	1,596	2	1,019	8	1,220	8	2	8
Segou	1,129	4	1,199	6	1,899	6	86	4
Mopti	2,804	1	2,533	2	3,651	2	35	5
Timbuktu	1,013	6	1,739	3	2,884	3	110	2
Gao	863	7	2,794	1	3,697	1	22	6
Kidal	71	8	1,662	4	2,102	4	7	7
Bamako	33	9	52	9	33	9	0	9
<b>Total</b>	<b>10,013</b>		<b>13,736</b>		<b>19,127</b>		<b>518</b>	
	Asins		Camelins		Pigs		Poultry	
	Number of employees	Rank	Number of employees	Rank	Number of employees	Rank	Number of employees	Rank
Kayes	83	7	3	6	0	5	6,673	4
Koulikoro	106	4	10	5	33	1	9,832	2
Sikasso	74	8	0	8	10	3	10,596	1
Segou	88	6	1	7	31	2	7,343	3
Mopti	137	3	16	4	4	4	2,957	6
Timbuktu	183	1	204	3	0	7	419	7
Gao	170	2	227	2	0	7	276	8
Kidal	98	5	518	1	0	7	126	9
Bamako	1	9	0	8	0	6	5,957	5
<b>Total</b>	<b>940</b>		<b>979</b>		<b>78</b>		<b>44,179</b>	

Source: Authors' calculations based on data from the Statistical Yearbook.

**Table 6. National milk production in 2013 by species and region (thousand liters)**

	Cattle		Sheep		Goats		Camelins	
	Quantity	Rank	Quantity	Rank	Quantity	Rank	Quantity	Rank
Kayes	47,027	5	32,209	5	32,612	7	1,320	6
Koulikoro	63,365	3	23,225	7	41,094	5	4,906	5
Sikasso	70,387	2	20,638	8	24,711	8	0	8
Segou	49,809	4	24,282	6	38,461	6	377	7
Mopti	123,640	1	51,290	2	73,939	2	7,736	4
Timbuktu	44,687	6	35,213	3	58,408	3	98,297	3
Gao	38,063	7	56,575	1	74,869	1	109,522	2
Kidal	3,135	8	33,655	4	42,566	4	249,514	1
Bamako	1,457	9	1,057	9	658	9	0	8
<b>Total</b>	<b>441,572</b>		<b>278,144</b>		<b>387,318</b>		<b>471,672</b>	

Source: Authors' calculations based on data from the Statistical Yearbook.

Thus, according to national milk production, the classification is as follows: Mopti in the lead 38 points followed closely by Gao 37 points, Kidal is third 32 points.

The quantity of milk collected is about 2 950 tons. This collection was carried out at 50 centers out of 53 planned, so 94.33% of centers [2].

On average, per capita consumption of milk and milk products per year amounts to 109 liters. This statistic places Mali in the category of countries with average milk consumption (30 to 150 kg/inhabitant/year) such as India, Japan, Kenya, North Africa, Southern Africa, Latin

America and the Caribbean, Mexico, Mongolia, Iran, New Zealand and most of the Near East. Argentina, Argentina, Armenia, Australia, Costa Rica, Europe, Israel, Kyrgyzstan, Pakistan and North America have the highest levels of consumption of milk and milk products in the world according to FAO (>150 kg/capita/year). The last category in this "low (<30 kg/inhabitant/year)" ranking is Vietnam, Senegal, most of Central Africa, East and Southeast Asia [10]. The regions of Mopti, Timbuktu, Gao and Kidal have statistics above the national average (12,602; 35,063; 51,452 and 485,498 respectively).

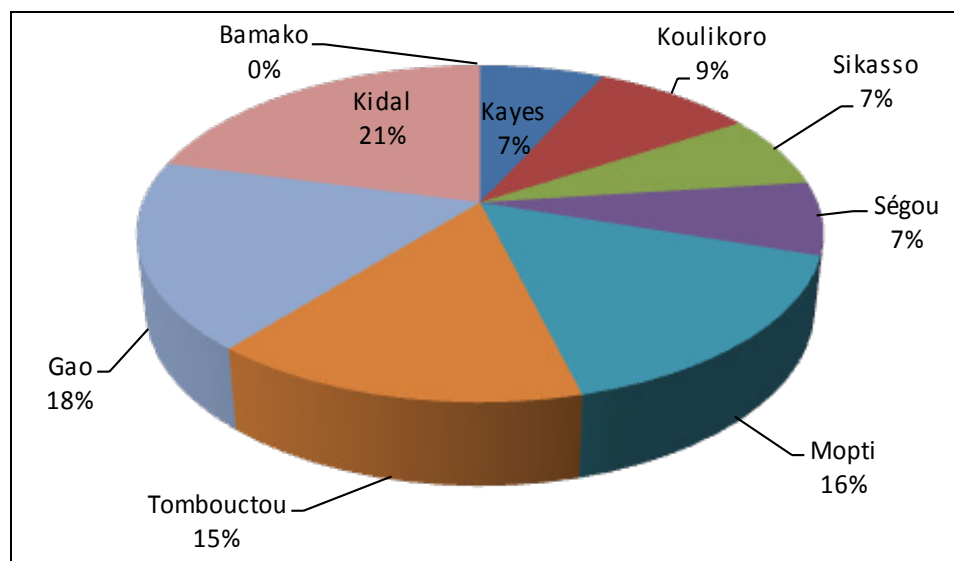


Figure 1. National milk production as a percentage in 2013

#### 5.4. Fishing Economy

The comment below refers to the consumption of fish caught by region on the national territory for the year 2013. Indeed, it is a function of culture, taste and availability. The inter-regional comparison by fish sector shows that there is no consistency in the ranking. Smoked fish is much more appreciated by the inhabitants of Gao (4.35 kg/capita) followed by those of Mopti (1.96 kg/capita) and Timbuktu (0.93 kg/capita) respectively. The other regions have a much lower consumption than Timbuktu. With a per capita consumption of dried fish of 2.63 kg, Gao is also in first place ahead of Timbuktu (1.05 kg/capita). The others having a consumption lower than kg/capita. In the fresh fish sector, Gao, the undisputed leader, leads with a consumption of 9.48 kg/capita followed by the Timbuktu region with a consumption of 3.12 kg/capita. Ségou is the third largest in this sector.

In terms of total fish consumption, it appears that in the Gao region fish is much more consumed (16.45 kg/capita) than in Timbuktu (5.11 kg/capita). Gao's consumption is close to the annual per capita consumption of developing countries, which in 2013 was 18.8 kg / inhabitant [4]. Ségou is in fourth place with a consumption of 1.81 kg/capita after Mopti (5.11). This implies that, on the

whole, fish is more appreciated by the inhabitants of Gao than any other region.

Table 7 (Annex) illustrates the consumption of fish caught on the national territory by region in 2013 under the assumption that the landing by region is only consumed by its households.

In terms of smoked fish, it appears that the regions of Mopti and Gao consume 73% of the total consumption while Timbuktu and Gao have 62.2% of dried fish. 74.6% of fresh fish consumption is attributable to the regions of Gao, Timbuktu and Ségou. The consumption of fresh and dried fish in the Ségou region is higher than in Mopti. This is confirmed by the per capita consumption of fish (1.03 compared to 0.64 for fresh fish and 0.25 compared to 0.24 for dried fish). The consumption of the Gao region alone is nearly 700 tons lower than the consumption of the three regions Ségou, Mopti and Timbuktu.

#### 5.5. Meat Industry

The analysis of the table shows that the first place goes to the Gao region with a score of 30 points ahead of Segou with 22 points. Mopti and Timbuktu are in third place with 21 points each followed by Sikasso, Koulikoro and Kayes respectively.

Table 7. Consumption of fish caught by region in 2013 (in tons)

Regions	Smoked fish		Dried fish		Fresh fish	
	Quantity	Rank	Quantity	Rank	Quantity	Rank
Kayes	37.5	7	33.9	7	284.4	7
Koulikoro	243.9	5	68.6	6	847.9	6
Sikasso	175.2	6	103.1	5	852.9	5
Segou	1,215.3	3	594.4	3	2,425.2	2
Mopti	3,997.5	1	499.7	4	1,306.5	4
Timbuktu	631.1	4	710.3	2	2,108.2	3
Gao	2,361.0	2	1,428.5	1	5,145.5	1
Kidal	0.0	8	0.0	8	0.0	8
Bamako	0.0	8	0.0	8	0.0	8
<b>Total</b>	<b>8,661.5</b>		<b>3,438.5</b>		<b>12,970.6</b>	

Source: Authors' calculations based on data from the Statistical Yearbook.

The analysis in Figure 2 shows that the Bamako district consumes 52% of the total officially slaughtered livestock in Mali compared to only 14% in Koulikoro, 12% in Kayes, 8% in Sikasso, 6% in Ségou, Mopti 4%, Timbuktu 2%, Gao and Kidal 1%. This consumption rate in Bamako is partly explained by the urbanization of the district (100% urban population). The proximity of the Koulikoro region to Bamako would explain the increase in its consumption rate, as the district is swallowed up by this region.

Table 8 (Annex) illustrates the slaughter of livestock at the national level under the assumption that livestock slaughtered in a locality is exclusively consumed by its households.

Despite the nullity and absence of certain statistics (camels and pigs), the district of Bamako is at the top of this ranking for livestock slaughter and meat consumption with a score of 45 points out of 54 ahead of Koulikoro 44 points. Kayes is in third place with 41 points, while Sikasso is fourth with 33 points. The regions of Ségou, Mopti, Kidal, Timbuktu and Gao occupy the other places respectively. The Bamako rate is explained by the fact that the vast majority of households regularly consume meat from cattle, sheep, goats and poultry. Camel breeding is not practiced in Bamako. The table also shows that Bamako is the third largest consumer of pork meat after Koulikoro and Segou.

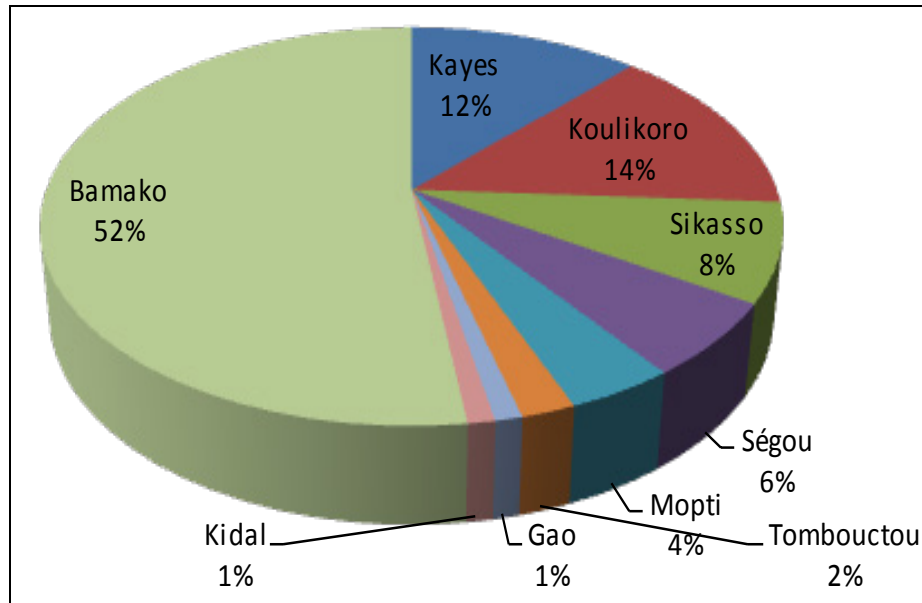


Figure 2. Slaughter of livestock on the national territory in 2013

Table 8. Slaughter of livestock by region in 2013

	Cattle			Sheep			Goats		
	Number of employees	Weight	Rank	Number of employees	Weight	Rank	Number of employees	Weight	Rank
Kayes	46,328	5,242.2	2	72,365	1,156.2	3	152,823	1,105.3	2
Koulikoro	28,184	2,484.3	4	46,527	4,733.6	2	26,725	371.2	5
Sikasso	34,098	3,810.5	3	32,213	397.8	5	72,928	729.3	4
Segou	22,430	2,310.7	5	25,886	337.2	6	74,906	870.7	3
Mopti	18,867	2,018.4	6	8,717	403.9	4	36,087	368.5	6
Timbuktu	4,674	530.3	7	15,285	205.0	7	28,643	349.4	7
Gao	3,242	399.0	8	1,992	23.9	8	16,680	183.5	8
Kidal	201	28.7	9	1,488	24.1	9	1,457	19.7	9
Bamako	136,476	18,338.0	1	136,207	7,564.0	1	164,167	1,847.8	1
<b>Total</b>	<b>294,500</b>	<b>35,162.1</b>		<b>340,680</b>	<b>14,845.7</b>		<b>574,416</b>	<b>5,845.4</b>	
	Camelins			Pigs			Poultry		
	Number of employees	Weight	Rank	Number of employees	Weight	Rank	Number of employees	Weight	Rank
Kayes	58	13.7	3	0	0.0		161,664	254.6	5
Koulikoro	366	13.9	2	97,520	1,241.9	1	450,803	598.8	2
Sikasso	0	0.0	8	0	0.0		271,736	588.8	3
Segou	47	5.8	7	1,926	89.6	2	182,452	172.9	6
Mopti	229	11.9	5	0	0.0		17,380	13.6	9
Timbuktu	70	12.8	4	0	0.0		15,660	18.6	8
Gao	276	11.8	6	0	0.0		2,412	24.9	7
Kidal	78	14.0	1	0	0.0		361	434.0	4
Bamako	0	0.0	8	NC	77.0	3	4,705,435	5,868.0	1
<b>Total</b>	<b>1,124</b>	<b>83.9</b>		<b>99,446</b>	<b>1,408.5</b>		<b>5,807,903</b>	<b>7,974.2</b>	

Source: Authors' calculations based on data from the Statistical Yearbook.

## 6. Summary of the Regional Classification

The analysis of [Table 7](#) and [Table 8](#) shows the following observations:

- Gao's region, which is the largest consumer of fish, has only the lowest share of meat, which means that fish is much more appreciated by households;
- in meat consumption, the Kayes region occupying third place is only the last in fish consumption;
- in Koulikoro, meat is more appreciated by households than fish. The indicators indicate that it is the second largest consumer of meat and sixth largest consumer of fish;
- Segou's region is the second largest consumer of fish and fifth of meat. We conclude that meat is less valued by households than fish;
- since Timbuktu is the fourth largest consumer of fish and the sixth largest consumer of meat, we are almost certain that fish seems to be better appreciated by households than meat;
- Sikasso is the fourth and fifth largest consumer of meat and fish respectively. This means that there is a negative correlation between meat consumption and fish consumption;
- households in the Mopti region consume much more fish than meat. Mopti is third in fish consumption and sixth in meat consumption;
- the absence of landings in the Kidal region and in the district of Bamako excludes these cities from the fish consumption ranking.

In short, the final ranking is done by assigning scores to each region according to the rank occupied by sector (demography, health, education, livestock, etc.). The notes are in the interval [0; 10]. The region with the highest rank gets the highest score and the region with the lowest score gets 3 points. Finally, the average score is calculated by dividing the total points by the total number of sectors. The average obtained in this way allows us to proceed to the final classification ([Table 9](#), Annex).

Generally speaking, we can classify the regions into three main categories. The first is all those with an average of more than 7 out of 10. These are the regions of Segou, Mopti and Koulikoro. The regions of Sikasso, Timbuktu and Gao form the second category with averages ranging from 6 to 6.5. The last one being Kayes and Kidal plus our out of category (Bamako) whose averages range from 5.88 to 5.25.

This classification confirms the agricultural aspect par excellence of the Ségou region. The colossal investments since colonial times in the Office du Niger area are

undoubtedly not for nothing in this performance. However, land productivity, although higher than the national average, is insufficient to make the region a major producer both within the sub-region and at the continental or global level. The only weak point in this result is the low level of milk production in which the Mopti region excels in second place in this ranking. In our opinion, it would be wise to increase or intensify investments in livestock and animal industries in order to create a specialized pole or specialized economic zone in this part of the country. The related industries are likely to be of great help in reducing local or even national unemployment and finished and/or intermediate products such as processed meat, milk and its derivatives, animal skins (used both in the food and leather industries) can be exported both to other regions and to outside the country. In this region, on the one hand, particular emphasis must be placed on health infrastructure to significantly improve health indicators in this area and on education where the region has the lowest literacy rate. However, the region does not have to worry about this, as it has very good economic indicators.

Koulikoro, 3<sup>rd</sup> in this category of the classification, does not excel in a particular field compared to the first two regions. Its good scores in teaching and slaughtering animals are due in part to its proximity to the capital. However, these indicators on the health level are insufficient.

The good scores of Sikasso and Timbuktu in agriculture and livestock make these regions candidates for poles specialized in types of production. These are maize and sorghum cultivation for Sikasso and small ruminant breeding for Timbuktu. The particularity of these regions in certain areas such as cattle breeding and wheat farming means that targeted investments must be made to make them major producers. In addition to this, Sikasso is very well known in arboriculture, making it the supplier of fruit from other regions. The Gao region, despite its position in the overall ranking (sixth), has very good scores in some areas (fishing, dairy production and livestock). Economic activity revolves mainly around the Niger River. With a very large dairy production capacity behind the Mopti region, Gao is only fourth in the livestock sector. The milk of small ruminants and camels explains this performance. In terms of health, the region has good indicators. Gao's comparative advantage over the country's regions lies in the fishing and dairy production sectors, where the orientation of efforts to organize them would be more welcome not only for the region but also for the rest of the country and especially the immediate neighboring countries of Burkina-Faso, Niger and Algeria.

**Table 9. Classification of Mali regions in 2013**

Regions	Demographics	Health	Education	Agriculture	Livestock	Milk	Fish	Slaughtering	Total Total	Average
Kayes	6	6	7	5	5	5	4	9	47	5.88
Koulikoro	8	3	10	6	9	6	5	10	57	7.13
Sikasso	10	4	9	9	3	3	6	8	52	6.50
Segou	9	7	8	10	6	4	9	7	60	7.50
Mopti	7	5	5	8	10	10	8	6	59	7.38
Timbuktu	5	9	4	7	8	7	8	4	52	6.50
Gao	4	8	3	4	7	9	10	3	48	6.00
Kidal	3	10	6	3	4	8	3	5	42	5.25
Bamako	6	6	10	3	3	3	3	10	44	5.50

Source: Authors' calculations based on data from the Statistical Yearbook.



The last group is composed of the regions of Kayes and Kidal and Bamako to a lesser extent. The very high level of slaughter confirms the "large consuming region" of Kayes. Indeed, it is the region with the most expatriates in the whole country. The transfers of income and consumer goods by the latter are used in part to feed the region. It is also a region whose subsoil is quite rich in dry mining resources.

One of the specificities of the Kidal region is Cameline milk production. The level of social indicators is quite acceptable with a very low malnutrition rate as in most parts of the northern part of the country. With favorable climatic conditions for camelina breeding, one of the advantages for the region is to specialize in this species.

## 7. Conclusion

Mali's regions are classified into three main categories. The first being all the regions that excel in rice and dairy production, these are Segou, Mopti and Koulikoro, which have good scores in education and animal slaughter. The second category is composed of the regions of Sikasso, Timbuktu and Gao, which have a comparative advantage in the production of certain cereal varieties, the breeding of certain small ruminants and fishing. The last group is

composed of the regions of Kayes, Kidal and Bamako to a lesser extent. Kayes is a migration region par excellence, while the Kidal region has a comparative advantage in camelina and camelina dairy production.

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