L'ÉVOLUTION DES FLUX MIGRATOIRES INTERRÉGIONALE EN ALGÉRIE

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Mots-clés: migration interne, indicateurs de migration, régions administratives, Algérie.

The evolution of interregional migratory flows in Algeria. This article focuses on the study of the evolution of internal migratory exchanges between all administrative regions of the Algerian territory between the years 1987 and 2008. The objective of this article is to quantify the intensity and concentration of internal migratory flows, the spatial orientation of migrants, the regions of preference, as well as the efficiency of interregional migration in Algeria. For this, we used the net migration rate, the Gini Coefficient index, the preference index, as well as the regional and national efficiency index. In order to carry out this work, we have created the matrices of migratory flows between the nine Algerian administrative regions based on migration data, which is published by the national statistics office. The results obtained show that migrations took place from the South to the North, with a preference for the Capital region and that for the Eastern Highlands. In terms of the efficiency of migratory flows, the redistribution of the population is very low, which makes the regional imbalance persistent, unless the regional planning policy is modified by developing new plans and methods to reduce the interregional imbalance.

1. INTRODUCTION

Ces derniers temps, la migration interne est le principal facteur de changement démographique et de répartition de la population. Elle joue également un rôle majeur dans le développement humain et économique aux niveaux local, régional, et même national, et cela est dû à la nature multidimensionnelle qui la caractérise. La migration est un processus répétitif avec des caractéristiques différentes en termes de distance et de durée, d'intensité et de concentration, de direction et de sélection, aussi que de portée et d'impact, toutes ces caractéristiques faisant de la migration interne l'un des sujets les plus complexes pour son étude.

Malgré les grandes complexités qui caractérisent l'étude de la migration interne et sa rareté depuis les premières études menées par le scientifique Ravenstein (1885), ces dernières années d'importants développements méthodologiques ont été réalisés dans les études de la migration à son niveau international, telle que l'étude de Faret (2020) sur la migration entre le Mexique et les États-Unis, les études de Heider *et al.* (2020), Becker et Heller (2009) sur Allemagne, celui de Beauchemin *et al.* (2021) sur la France, et plusieurs d'autres (Malmberg, 2021). Des centres et entrepôts internationaux ont également été créés comme preuve de la migration interne. Tous ces développements ont conduit à l'émergence de nombreux articles et documents sur la migration interne telle que l'étude de Arnoult (2020) sur la France, l'étude de Vakulenko et Mkrtchyan (2020) sur la Russie, l'étude de Bhagat et Keshri (2020) sur l'Inde, l'étude de Ishikawa (2020) sur le Japon, l'étude de Pérez-Campuzano *et al.* (2018) sur le Mexique, l'étude de Diepart et Ngin (2020) sur le Cambodge, et plusieurs d'autres. Toutes ces études montrent la grande corrélation entre les flux migratoires internes et la répartition spatiale de la population.

L'Algérie, après l'indépendance, s'est trouvée face à un déséquilibre démographique sur le territoire (Sari, 1993; Rahmani, 1982; Cote, 1988; Redjimi, 2000; Kateb, 2003), et plus de 63% de la

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population s'est concentrée dans le nord du pays sur une superficie qui ne dépasse pas les 5% du territoire national (RGPH, 2008). Dans un souci de promouvoir un équilibre régional et un développement solidaire, l'Algérie a mis en œuvre de nouvelles stratégies spatiales en vue d'un redéploiement de la population et l'orienter vers le sud du territoire, à travers les orientations du schéma national d'aménagement du territoire (SNAT) basé sur un découpage du territoire en neuf régions.

La réorientation de la population nécessite une connaissance de ses mouvements. En effet, les interactions entre les lieux sont considérablement expliquées par les flux migratoires (Desplanques, 1994; Baccaïni, 2006). Par manque d'études des mouvements migratoires sur l'Algérie, comparativement à d'autres pays, cela nous a amené à mettre en évidence une toute première étude sur l'analyse de la migration interne sur tout le territoire algérien.

L'objectif de ce travail est d'étudier le phénomène migratoire interne en Algérie à travers l'analyse de l'intensité migratoire, la concentration et l'orientation des flux migratoires et l'impact de ces flux sur la redistribution de la population. Cette étude se fait sur tout le territoire algérien, entre les neuf régions administratives, et au cours de deux périodes: 1987–1998 et 1998–2008. En se basant sur les résultats des recensements de 1998 pour la première période, et le dernier et le plus récent jusqu'à nos jours – le recensement de 2008 – pour la deuxième période.

Cette étude tire son importance de la nature du sujet traité et de sa portée spatiale. C'est l'un des domaines d'intérêt les plus importants en géographie. Et en raison de la rareté d'études liées à la migration interne dans les pays d'Afrique du Nord, cette étude est venue apporter le complément. Et cette étude sur le plans local est considéré comme un outil important, d'une part pour l'évaluation des stratégies précédentes, dont l'objective était de redéployer la population vers le Sud et développer ses régions, et d'autre part, un outil d'aide à la décision pour le futur dans la politique d'aménagement du territoire et la politique de développement en Algérie.

2. MÉTHODE ET DONNÉES

Depuis l'indépendance à ce jour, l'Algérie a fait cinq recensements (1966, 1977, 1987, 1998 et 2008), dans lesquels la migration interne a été une importante variable en raison de la nature différente des objectifs fixés d'un recensement à l'autre. Après le dernier recensement (2008) jusqu'à ce jour (soumission de l'article), l'Algérie n'a fait aucun recensement malgré la programmation d'un recensement durant l'année de 2018.

Cette analyse est basée sur les résultats du recensement de la population et l'habitat (RGPH), car ils sont les uniques sources de données disponibles sur la migration interne de la population en Algérie. De ce fait, notre étude est limitée sur deux périodes (1987-1998 et 1998-2008), en se basant sur les résultats des recensements de 1998 et le dernier et le plus récent recensement de 2008. Les données de la migration interne des recensements de 1966, 1977 et 1987 ne sont pas prises en compte dans cette analyse, leur exclusion est justifiée comme suit:

- Pour les recensements de 1966 et 1977: la plupart des informations sur la migration interne sont restées stockées dans les formulaires et seule une petite partie a été diffusée.
- Pour le recensement de 1987: un manque de représentativité a été observé, puisque les données sur la migration sont des données relatives à un échantillon de 1/10, ce qui ne reflète pas la réalité de l'ensemble de la population, à cela s'ajoute la difficulté de préciser le lieu de résidence lors du recensement qui le précède (1977), en raison du découpage territorial (1984) qui a permis de passer de 31 à 48 wilayas et de 704 à 1.541 communes.

Les résultats des recensements (RGPH 1998, 2008) permettent de connaître le nombre des migrants, c'est-à-dire la population qui a changé son lieu de résidence (commune et/ou wilaya) à la date du précédent recensement.

Les données migratoires fournies par l'office national des statistiques (ONS) ne sont pas fournies par région, elles sont, par contre, établies par Wilaya et par commune. Pour identifier les mouvements migratoires entre les régions, nous les avons calculés en agrégeant les données de migration pour les Wilayas appartenant à la même région, pour chaque période.

Pour atteindre notre objectif, et pour l'analyse et la comparabilité des données, cet article s'appuie sur plusieurs indicateurs et coefficients:

- **Pour mesurer l'intensité de la migration**, nous allons calculer le taux de migration interne net (Wang *et al.*, 2020; Rajan *et al*., 2019; Hepburn *et al.*, 2016; Yusuf *et al.*, 2014; Poston *et al.*, 2010; Agarwal, 2007); ce taux est le rapport entre le solde migratoire et la population moyenne d'une zone considérée. L'indicateur est généralement exprimé pour 1.000 habitants.
- **Pour mesurer la concentration de la migration,** nous allons calculer le Coefficient de GINI, (Wunsch, 2012; Rogers, 2020; Suzuki, 2019; Wilson *et al.*, 2016; Batabyal, 2015; Stillwell *et al.*, 2010; Liu et Gu, 2020; He, J. et Pooler, J., 2002; Gries *et al.*, 2016), car il permet de savoir si les sorties d'une région se répartissent uniformément dans les autres régions, ou se concentrent dans quelques régions du territoire. Le coefficient de GINI est calculé par l'équation suivante:

$$\mathbf{G_x} = \frac{\sum_{s=1} fs - {}^1/_2\left(100 * (n-1)\right)}{{}^1/_2\left(100 * (n-1)\right)}$$

X: la région étudiée.
fs: somme cumulée des fréquences relatives des migrations.
n: nombre de régions.

Le calcul de la somme cumulée des fréquences relatives des migrations s'effectue selon les étapes suivantes:

1. On calcule les pourcentages des sortants de la région étudiée X vers chaque région d'accueil.
2. On met en ordre décroissant les résultats.
3. On calcule la somme cumulée des résultats.

La valeur du coefficient de GINI est toujours comprise entre 0 et 1, si elle tend vers 1 la migration des sortants s'effectue avec plus de concentration; si elle tend vers le 0, la migration des sortants s'effectue avec plus de dispersion.

- **Pour connaître l'orientation des flux migratoires**, nous allons calculer l'Indice de Préférence régional et national (Wunsch, 2012; St-Laurent, O., 2010). Cet indice nous permet de mesurer les régions de préférence des sortants de chacune des régions et de l'ensemble du système.
- **L'indice de préférence régional** (IP) permet de savoir l'orientation spatiale des migrations. Il se calcule en rapportant les migrants observés (les sortants réels de la région X vers la région Y) et les migrants attendus (les sortants de la région X vers la région Y s'ils n'ont pas de préférence.

$$\mathrm{IP_{xy}} = \frac{\mathrm{M_{xy}\ Observés}}{\mathrm{M_{xy}\ Attendus}}$$

Dont: **x** (région étudiée), **y** (région de destination)

Les migrants attendus de la région **X** vers la région **Y** sont calculés par la formule suivante:

$$\mathrm{M_{xy}\ Attendus} = \sum \mathrm{M_{xz}} * \left\{\frac{\sum_{x\neq y}^{M_{xz}}}{\sum_x \sum_z \mathrm{M_{xz}}}\right\}$$

Dont: **x** (région d'origine); **z** (région de destination); **y** (région étudiée)

Si l'indice de préférence est inférieur à 1, la région de destination Y ne fait pas partie des préférées des sortants de la région de X. Plus l'indicateur est supérieur à 1, plus la région Y est préférée des sortants de la région X.

– **L'indice de préférence national:** l'indice de préférence peut être également appliqué à l'ensemble du système, dont l'objectif est de créer une échelle nationale pour la préférence des migrants. On peut calculer cet indice selon les étapes suivantes:

1. On calcule la somme des différences positives entre le nombre des migrants observés et le nombre des migrants entrants attendus dans chaque région du territoire.
2. On divise cette somme par le nombre total de migrations interrégionales pour la même période.
3. En appliquant ces deux étapes à toutes les régions du territoire, on obtient une échelle de préférence nationale.

– **Pour mesurer la redistribution de la population,** l'indice de l'efficience nous permet d'établir une telle relation (Wunsch, 2012; Rogers, 2020; Catney, 2016; Kulcsár *et al.*, 2012; Poston Jr., D.L. & Bouvier, L.F., 2010; Hochstadt, S., 1999; Pandit, K. & Withers, S.D. (Eds.)., 1999; Long, 1988). Cet indice sur le niveau régional est le rapport du solde migratoire (le nombre des entrants - le nombre des sortants) sur l'intensité du phénomène (le nombre des entrants + le nombre des sortants), et sur le niveau national est le rapport entre la somme des soldes migratoire positifs des régions du système et le nombre total national de migrants.

3. CARACTÉRISTIQUES GÉNÉRALES DE LA ZONE D'ÉTUDE

À partir des années 2000, l'Algérie a connu une grande rénovation de ses compositions territoriales administratives et politiques. La loi N° 01-20 du 12/12/2001 relative à l'aménagement et au développement durable du territoire a découpé le territoire algérien en neuf régions (Tableau 1), fondé sur le regroupement des wilayas limitrophes qui présentent des problématiques de développement similaires ou complémentaires.

Tableau 1

Répartition des wilayas dans les régions

Région	Nombre de wilaya	Wilaya
Le Nord-Centre – région Capitale – **(N.C)**	10	Alger, Chlef, Bejaia, Blida, Bouira, Tizi-Ouzou, Médéa, Boumerdes, Tipasa et Ain Defla.
Le Nord-Est **(N.E)**	8	Jijel, Skikda, Annaba, Guelma, Constantine, El-Tarf, Souk Ahras et Mila.
Le Nord-Ouest **(N.O)**	7	Tlemcen, Sidi-Belabbes, Mostaganem, Mascara, Oran, Ain Temouchent et Relizane.
Les Hauts Plateaux Centre **(H.P.C)**	3	Laghouat, Djelfa et M'sila.
Les Hauts Plateaux Est **(H.P.E)**	6	Oum-El-Bouaghi, Batna, Tebessa, Setif, Bordj-Bou-Arreredj et Khenchela.
Les Hauts Plateaux Ouest **(H.P.O)**	5	Tiaret, Saida, El Bayadh, Tissemsilt et Naama
Le Sud-Est **(S.E)**	4	Ouargla, El-Oued, Ghardaïa et Biskra.
Le Sud-Ouest **(S.O)**	3	Bechar, Adrar et Tindouf
Le Hoggar-Tassili **(H-T)**	2	Tamanrasset et d'Illizi

(Source: La loi N° 01–20 du 12/12/2001 relative à l'aménagement et au développement durable du territoire).

Les neuf régions créées sur la base du découpage administratif des wilayas est un choix qui a généré beaucoup de wilayas dans les régions du Nord, de petite superficie, donc très rapprochée les

unes des autres, contrairement au Sud, où les wilayas sont de très grande superficie, donc éloignées les unes des autres (Fig. 1).

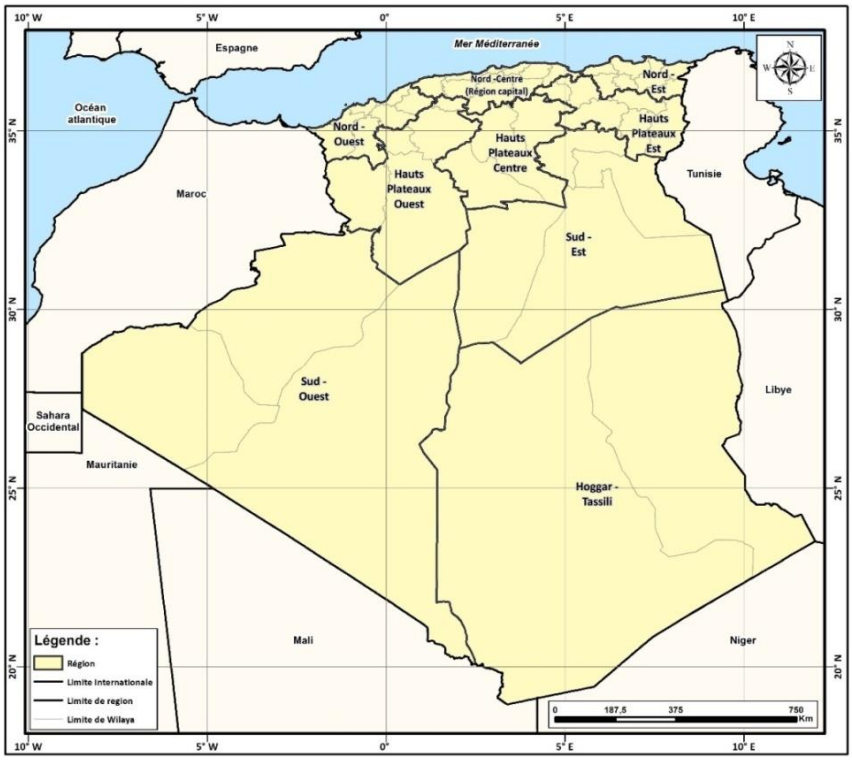

Fig. 1 – Carte des Régions.
(Source: La loi N° 01-20 du 12/12/2001 relative à l'aménagement et au développement durable du territoire).

Les régions du Nord, bien qu'en surface moindre par rapport aux autres régions, comptent pratiquement un peuplement de 63% de la population, en majeure partie dans la région Nord-Centre (région Capitale), qui révèle plus de 30% de la population totale du pays. Par ailleurs, les régions des Hauts Plateaux comptent un peuplement de 27%. Le reste du pays (les régions du Sud), c'est-à-dire 82,95% de la superficie totale de l'Algérie, a enregistré un peuplement de 10% de la population totale du pays en 2008 (Tableau 2).

Tableau 2

La répartition de la population totale selon les régions (1998–2008)

Région	**Population en Millions et en %**			
	1998		***2008***	
Le Nord-Centre (Région Capitale)	9,42	**32%**	10,7	**31%**
Le Nord-Est	4,55	**16%**	5,18	**15%**
Le Nord-Ouest	4,84	**17%**	5,63	**17%**
Les Hauts Plateaux Centre	1,92	**7%**	2,54	**7%**
Les Hauts Plateaux Est	4,23	**15%**	4,9	**14%**
Les Hauts Plateaux Ouest	1,57	**5%**	1,89	**6%**
Le Sud-Est	1,83	**6%**	2,29	**7%**
Le Sud-Ouest	0,56	**2%**	0,72	**2%**
Le Hoggar-Tassili	0,17	**1%**	0,23	**1%**
Total (Algérie)	**29,09**	**100%**	**34,08**	**100%**

(Source: ONS, RGBH, 1998 et 2008).

Le déséquilibre se ressent tant à l'échelle nationale qu'à l'échelle régionale générée par les conditions naturelles surtout climatiques et les schémas de développement qui sont axés sur la constitution des pôles industriels autour des grandes métropoles du Nord (ORAN, ALGER, ANNABA). Cette politique qui paraissait efficace du point de vue rééquilibrage des grandes masses jusqu'à la fin des années Quatre-vingt, est aujourd'hui lourde de conséquences, et un déséquilibre national et régional est observé en raison de la mauvaise répartition de la population du Nord au Sud.

4. RÉSULTATS

4.1. Une diminution de la migration interne

La migration interne en général a touché 2.836.182 personnes entre 1987 et 1998 de la population totale recensée en 1998. Dans la période suivante 1998-2008 la migration enregistre une baisse, 1.785.495 personnes de la population totale recensée en 2008 ont changé leur lieu de résidence.

Le taux de changement de commune passe ainsi de 7,28% entre 1987 et 1998 à 3,51% entre 1998 et 2008. Le taux de changement de wilaya passe de 1,85% dans la première période à 1,05% dans la seconde période. Le taux de changement de région diminue quant à lui, de 1,75% à 1,09%.

On remarque une baisse très importante dans la migration interne, le taux de migrant passe de 10,87% dans la première période (1987-1998) à 5,65% dans la deuxième période (1998-2008); cette baisse a touché tous les niveaux (commune, wilaya et région; Fig. 2).

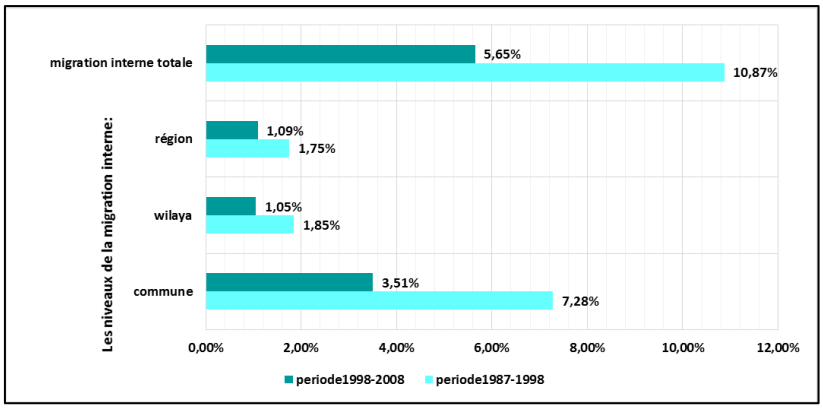

Fig. 2 – Les niveaux de la migration interne en Algérie (1987–1998 et 1998-2008).
(Source: traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

4.2. L'intensité de la migration

– La configuration des flux migratoires

L'indice de mesure ou de calcul qui définit chaque zone par son attraction ou sa répulsion et qui offre une comparabilité des effets des flux migratoires entre les régions et les périodes dont la taille de la population varie est le taux de migration interne net.

Pour la période 1987–1998, les régions attractives sont classées selon leur taux de migration interne net positif; la région Nord-Ouest est la région la plus attractive, possédant ainsi un taux très positif (1,37‰) suivi successivement par la région Sud-Est (0.74‰), la région Hauts Plateaux Centre et la région Hoggar-Tassili (0,23‰ et 0,17‰).

Cette même période classe la région Sud-Ouest comme la plus répulsive avec un taux de migration net négative de -0,97‰; ensuite, viennent la région Hauts Plateaux Est avec un de taux de -0,54‰, moins encore répulsive, la région Hauts Plateaux Ouest et la région Nord-Centre (région Capitale); enfin, la région du Nord-Est avec un taux de migration interne net relativement le moins négatif (Fig. 3).

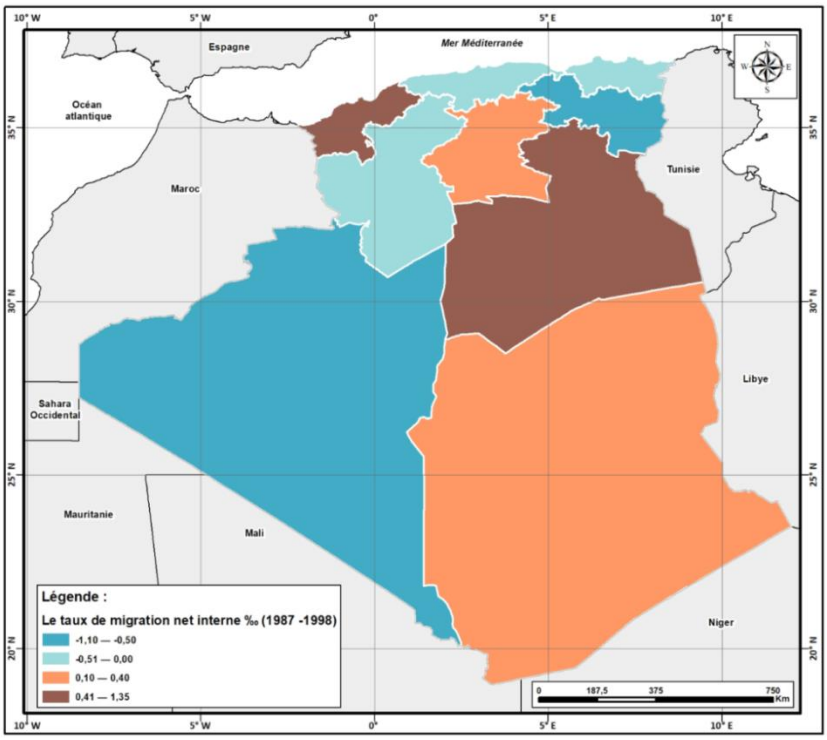

Fig. 3 – Carte des Taux de migration net (‰) interrégionale en Algérie (1987–1998).
(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001.).

Ce constat pourrait être expliqué par l'insécurité qui caractérisait l'Algérie durant cette période, où la population des régions les plus touchées par le terrorisme, notamment la région Capitale, ont été contraints de s'évader vers les régions plus ou moins sécurisées, telles que la région Nord-Ouest, la région Sud-Est et la région des Haut Plateaux Centre.

En ce qui concerne la période 1998-2008, le taux de migration interne net par rapport à la période 1987–1998 a changé dans la région Nord-Centre, qui est devenue la région la plus attractive avec un taux de 1,09‰ suivie par la région Nord-Ouest, la région Hoggar-Tassili, la région Sud-Ouest et enfin, la région Sud-Est.

Dans cette période, d'autres régions sont devenues répulsives, la région des Hauts Plateaux Centre avec un taux de migration net négative de -0.13‰, la région du Nord-Est, la région des Hauts Plateaux Ouest et la région des Hauts Plateaux. Cependant, cette dernière reste la région la plus répulsive (Fig. 4).

Le tiers des régions ont subi un changement important dans la configuration du taux de migration interne net. La région Nord-Centre (région Capitale) devient la région la plus attractive, le même cas pour la région du Sud-Ouest, qui devient aussi attractive, contrairement au taux de la région des Hauts Plateaux Centre, qui devient répulsive.

Il faut signaler que la politique de centralisation administrative et économique qui caractérisait l'Algérie depuis son indépendance, a fait que les régions du Nord de l'Algérie, et notamment la région Capitale, étaient toujours des régions attractives; c'est la raison pour laquelle cette configuration a été rétablie une fois la crise sécuritaire résolue au début de la deuxième période (1998–2008).

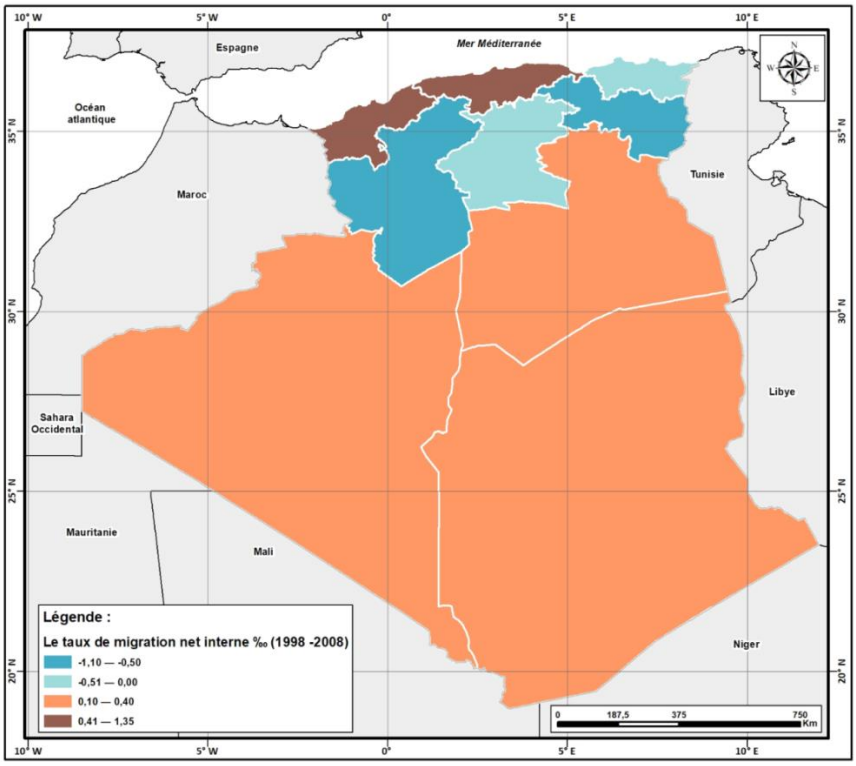

Fig. 4 – Carte des Taux de migration net (‰) interrégionale en Algérie (1998–2008).
(Source: Traitement d'auteurs sur la base des données d'ONS, Collections Statistiques N° 159/2011 Série S.).

– Une variation des entrants et des sortants des régions

Les mouvements migratoires se caractérisent par un volume d'entrées et de sorties variables dans la direction, dans l'espace et dans le temps. La résultante de ces mouvements est le solde migratoire, l'amélioration de ce dernier est la conséquence de modifications des composantes du mouvement, qui sont les entrées et les sorties. Ce solde migratoire peut s'améliorer dans une région de deux manières différentes, qui sont, soit l'augmentation des arrivées et/ou la diminution des sorties, pour les régions dites attractives. Le contraire pour les régions répulsives, qui ont les conséquences de la diminution de volume des entrées et/ou l'augmentation de volume des sorties (Baccaïni, 2007).

La région Nord-Centre (région Capitale) se distingue de toutes les autres régions par son évolution particulière. Dans la période 1998–2008, l'augmentation du solde migratoire interne résulte principalement d'une forte diminution des départs, qui pourrait être expliquée par le rétablissement sécuritaire, d'un autre côté les arrivées restent à peu près stables.

Le même principe s'applique à la région Sud-Ouest, car le changement de la configuration du solde migratoire interne est dû principalement à la diminution du nombre de départs. Cette dernière est due au développement économique de cette région, notamment dans l'industrie des hydrocarbures.

Les régions ont connu une diminution équilibrée du nombre de départs et d'arrivées car elles tiennent toujours la même configuration du solde migratoire, sauf pour la région des Hauts Plateaux Centre, où le nombre des entrées a connu une chute très importante dans la deuxième période, ce qui a fait que cette région devienne répulsive, contrairement à la période 1987–1998 où elle a été attractive (Tableau 3, Fig. 5).

Tableau 3

Le solde migratoire et le taux de migration net interne (‰) des régions (1987–1998 et 1998–2008)

Région	1987-1998				1998-2008			
	Entrée	**Sortie**	**Solde Migratoire**	**Taux de migration interne net** (‰)	**Entrée**	**Sortie**	**Solde Migratoire**	**Taux de migration interne net** (‰)
Le Nord-Centre – région Capitale – **(N.C)**	106.115	117.286	-11.171	**-0,43**	100.426	65.982	34.444	**1,09**
Le Nord-Est **(N.E)**	54.290	56.444	-2.154	**-0,08**	36.052	45.215	-9.163	**-0,29**
Le Nord-Ouest **(N.O)**	76.233	41.114	35.119	**1,35**	54.794	39.658	15.136	**0,48**
Les Hauts Plateaux Centre **(H.P.C)**	45.414	39.345	6.069	**0,23**	25.333	29.442	-4.109	**-0,13**
Les Hauts Plateaux Est **(H.P.E)**	67.607	81.821	-14.214	**-0,54**	41.185	73.368	-32.183	**-1,02**
Les Hauts Plateaux Ouest **(H.P.O)**	32.368	44.758	-12.390	**-0,48**	22.277	38.041	-15.764	**-0,50**
Le Sud-Est **(S.E)**	48.972	29.546	19.426	**0,74**	35.154	31.840	3.314	**0,10**
Le Sud-Ouest **(S.O)**	15.334	40.543	-25.209	**-0,97**	19.395	15.241	4.154	**0,13**
Le Hoggar-Tassili **(H–T)**	10.135	5.611	4.524	**0,17**	10.489	6.318	4.171	**0,13**

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

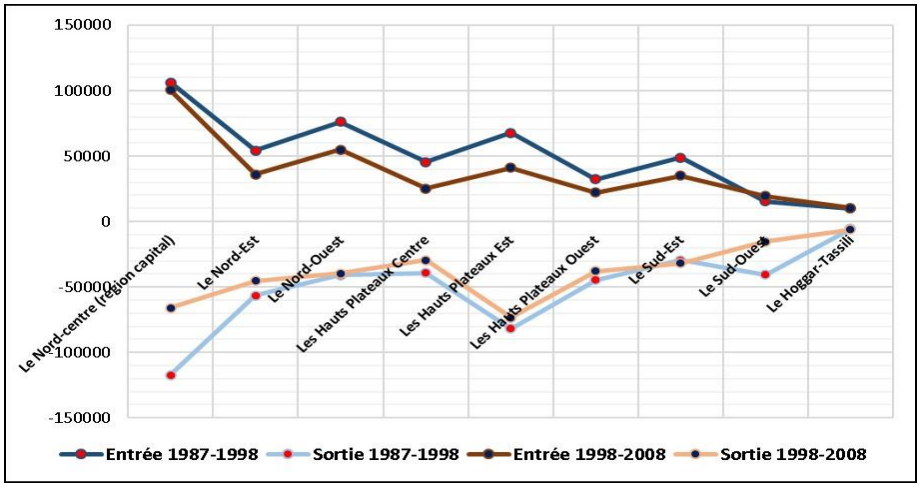

Fig. 5 – Entrants et sortants des régions (1987–1998) et (1998–2008).
(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S.).

4.3. La concentration des flux migratoires

Pour améliorer notre connaissance des flux migratoires, nous devons mesurer la concentration de la migration. En observant le coefficient de Gini pour les deux périodes, nous pouvons constater que la période 1998–2008 où les migrations des sortants des régions ont été un peu plus concentrées par rapport à la première période 1987-1998, comme nous pouvons constater aussi que le coefficient de Gini enregistré pour chaque région, sur les deux périodes, est très proche, pour presque toutes les régions (Tableau 4).

Tableau 4

Coefficient de Gini des régions administratives de l'Algérie (1987–1998 et 1998–2008)

REGION	1987–1998	1998–2008
Le Nord-Centre – région Capitale – **(N.C)**	0,47	0,44
Le Nord-Est **(N.E)**	0,7	0,67
Le Nord-Ouest **(N.O)**	0,58	0,59
Les Hauts Plateaux Centre **(H.P.C)**	0,55	0,62
Les Hauts Plateaux Est **(H.P.E)**	0,68	0,69
Les Hauts Plateaux Ouest **(H.P.O)**	0,75	0,74
Le Sud-Est **(S.E)**	0,48	0,51
Le Sud-Ouest **(S.O)**	0,41	0,46
Le Hoggar-Tassili **(H-T)**	0,39	0,48

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

Le coefficient de Gini nous a permis de classer les neuf régions administratives dans trois classes.

La première classe est celle qui a les coefficients les plus élevés, plus de 0,65, cette classe contient trois régions, la région Hauts Plateaux Ouest avec le coefficient le plus élevé de toutes les régions sur les deux périodes 0,75 et 0,74, la région Hauts Plateaux Est avec un coefficient de 0,68 et 0,69 et la troisième région est la région Nord-Est avec 0,70 et 0,67.

Dans la deuxième classe où le coefficient est moyen, entre 0,48 et 0,65, trois régions sont inclues : la région Hauts Plateaux Centre avec un coefficient de 0,55 et 0,62, la région Nord-Ouest avec 0,58 et 0,59, et la région Sud-Est avec 0,48 et 0,51.

La troisième classe qui affiche les coefficients de Gini les plus bas, moins de 0,48 contient aussi trois régions: la région Hoggar-Tassili, la région sud-ouest et la région Nord-Centre (région Capitale).

La région Capitale et les deux autres régions de la dernière classe sont des régions déconcentrées, la migration des sortants de ces régions s'effectue avec plus de dispersion. On peut expliquer cela par l'existence de plusieurs choix de régions d'accueil dans leur migration. Les régions de la deuxième classe sont les régions intermédiaires, le coefficient de Gini est moyen, il n'y a donc ni forte concentration, ni grande dispersion spatiale des sortants. Ce groupe contient la région Hauts Plateaux Centre, la région Nord-Ouest et la région Sud-Est. Finalement, les régions de la première classe où le coefficient de Gini est le plus haut, sont les plus concentrées, pour les deux périodes. Les émigrants de ces régions se concentrent dans quelques régions d'accueil qui sont souvent la région Capitale ou les autres régions voisines, dans le nord ou le sud.

4.4. L'orientation des flux migratoires

Pour connaître l'orientation des flux migratoires, nous allons calculer l'Indice de Préférence régional et national, qui nous permet de mesurer les régions de préférence des sortants de chacune des régions et de l'ensemble du système.

– L'indice de préférence régional:

La région préférée des sortants de la région Capitale, sur les deux périodes, est la région Hauts Plateaux Centre (Tableau 5), il s'agit toujours d'une région limitrophe, deux fois plus de sortants de cette région y sont arrivés que ce qui était attendu. Les deux régions restantes de la zone géographique du nord du pays, la région Nord-Est et la région Nord-Ouest, ont un classement de préférence bien différent, mais il s'agit toujours des régions limitrophes (Tableau 6). Les sortants de la région Nord-Est ont comme région de préférence les Hauts Plateaux Est, l'indice de préférence est environ de 2,5 au cours des deux périodes; les sortants de la région Nord-Ouest ont comme région de préférence les Hauts Plateaux Ouest, avec plus de 4 fois le nombre de migrants attendus.

Tableau 5

Indices de préférences des régions des sortants de la région Nord-Centre (région Capitale) (1987–1998 et 1998–2008)

1987–1998		**1998-2008**	
RÉGION	**Indices de préférences**	**RÉGION**	**Indices de préférences**
Les Hauts Plateaux Centre **(H.P.C)**	**2,1022**	Les Hauts Plateaux Centre **(H.P.C)**	**1,9234**
Les Hauts Plateaux Est **(H.P.E)**	**1,4860**	Le Nord-Ouest **(N.O)**	**1,6627**
Le Nord-Ouest **(N.O)**	**1,2919**	Les Hauts Plateaux Est **(H.P.E)**	**1,5525**
Le Sud-Est **(S.E)**	**1,1182**	Le Nord-Est **(N.E)**	**1,3164**
Le Nord-Est **(N.E)**	**1,0325**	Le Sud-Est **(S.E)**	**1,1641**
Le Sud-Ouest **(S.O)**	**0,9338**	Les Hauts Plateaux Ouest **(H.P.O)**	**1,0455**
Les Hauts Plateaux Ouest **(H.P.O)**	**0,9093**	Le Sud-Ouest **(S.O)**	**1,0099**
Le Hoggar-Tassili **(H.T)**	**0,7388**	Le Hoggar-Tassili **(H.T)**	**0,9604**

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S.)

Tableau 6

Indices de préférences des régions des sortants de la région Nord-Est et la région Nord-Ouest (1987–1998 et 1998–2008)

Région Nord-Est				**Région Nord-Ouest**			
1987–1998		**1998–2008**		**1987–1998**		**1998-2008**	
Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**
H.P.E	2,4478	**H.P.E**	2,4546	**H.P.O**	4,9812	**H.P.O**	4,1379
N.C	1,6694	**N.C**	1,4380	**S.O**	3,5116	**S.O**	2,7818
S.E	0,7572	**S.E**	1,0024	**N.C**	1,1213	**N.C**	1,1822
H.T	0,6312	**H.T**	0,7866	**H.T**	0,7559	**H.T**	0,7342
N.O	0,5080	**H.P.C**	0,6505	**N.E**	0,7141	**H.P.C**	0,6053
H.P.C	0,4190	**S.O**	0,5840	**H.P.C**	0,5740	**N.E**	0,5634
S.O	0,3950	**N.O**	0,4086	**H.P.E**	0,4367	**H.P.E**	0,4908
H.P.O	0,2021	**H.P.O**	0,2655	**S.E**	0,4162	**S.E**	0,4748

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

En ce qui concerne les régions de la zone géographique des Hauts Plateaux, les sortants de la région Hauts Plateaux Est optent majoritairement pour la région Nord-Est: plus du double des migrants s'y trouvent que ce qui était attendu. Pour la région Hauts Plateaux Ouest, la région de préférence est la région Nord-Ouest, qui attire au cours des deux périodes plus du triple des migrants que ce qui était attendu. Concernant la région Hauts Plateaux Centre, les sortants de cette région ont comme région de préférence la région Sud-Est pour la première période (1987–1998), la seconde période le plus haut indice de préférence est enregistré à la région Capitale (Tableau 7).

Tableau 7

Indices de préférences des régions des sortants des Hauts Plateaux (1987–1998 et 1998–2008)

Région des Hauts Plateaux Centre				**Région des Hauts Plateaux Est**				**Région des Hauts Plateaux Ouest**			
1987–1998		**1998–2008**		**1987–1998**		**1998–2008**		**1987–1998**		**1998–2008**	
Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**
S.E	2,0002	**N.C**	1,5862	**N.E**	2,1355	**N.E**	2,0719	**N.O**	3,2062	**N.O**	3,4674
N.C	1,3676	**S.E**	1,4854	**N.C**	1,7344	**S.E**	1,5858	**S.O**	1,8523	**S.O**	1,3130
H.P.O	1,1029	**H.P.O**	1,1660	**S.E**	1,6456	**N.C**	1,5511	**N.C**	1,0237	**H.P.C**	0,9898
H.P.E	0,9413	**H.P.E**	1,1430	**H.P.C**	0,5597	**H.P.C**	0,8977	**H.P.C**	0,7864	**N.C**	0,7204
N.E	0,8415	**N.E**	0,6112	**H.T**	0,5037	**H.T**	0,5292	**S.E**	0,3824	**S.E**	0,5275
N.O	0,7498	**N.O**	0,4717	**N.O**	0,4561	**S.O**	0,3543	**H.T**	0,3361	**H.T**	0,3572
S.O	0,4517	**S.O**	0,4285	**S.O**	0,3114	**N.O**	0,3436	**H.P.E**	0,1410	**N.E**	0,1331
H.T	0,4224	**H.T**	0,4146	**H.P.O**	0,1805	**H.P.O**	0,2196	**N.E**	0,1407	**H.P.E**	0,1247

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

Enfin, dans les trois régions du sud du pays il semble exister une sorte de mouvance autour de ces régions. En effet, les sortants de ces régions migrent dans cette même zone. Plus précisément, la région Hoggar-Tassili est la région de préférence pour les sortants des deux régions: la région Sud-Est et la région Sud-Ouest, sur les deux périodes. Pour les sortants de la région Hoggar-Tassili, la destination de préférence est la région Sud-Ouest (Tableau 8).

Tableau 8

Indices de préférences des régions des sortants du Sud (1987–1998 et 1998–2008)

Région Sud-Est				**Région Sud-Ouest**				**Région Hoggar-Tassili**			
1987–1998		**1998–2008**		**1987–1998**		**1998–2008**		**1987–1998**		**1998–2008**	
Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**	Région	**IP**
H.T	4,0152	**H.T**	2,9388	**H.T**	2,7528	**H.T**	3,8620	**S.O**	4,8862	**S.O**	4,8469
H.P.E	1,8814	**H.P.E**	1,9183	**H.P.O**	1,4811	**H.P.O**	2,2961	**S.E**	1,7094	**S.E**	1,7542
H.P.C	1,6979	**H.P.C**	1,5907	**N.E**	1,3364	**N.O**	1,8691	**N.E**	0,9785	**H.P.E**	0,8568
N.E	1,0899	**N.E**	1,4046	**N.O**	1,1681	**S.E**	0,8470	**N.C**	0,8870	**N.E**	0,8318
S.O	0,9038	**N.C**	0,9827	**N.C**	1,1061	**N.E**	0,7122	**N.O**	0,8836	**N.C**	0,6978
N.C	0,8389	**S.O**	0,7086	**H.P.C**	0,7028	**N.C**	0,6295	**H.P.E**	0,6654	**N.O**	0,5612
N.O	0,4615	**N.O**	0,4362	**S.E**	0,6272	**H.P.C**	0,4952	**H.P.C**	0,5356	**H.P.O**	0,4953
H.P.O	0,4401	**H.P.O**	0,3596	**H.P.E**	0,5772	**H.P.E**	0,4811	**H.P.O**	0,4298	**H.P.C**	0,4851

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

– L'indice de préférence national:

D'après les résultats de l'indice de préférence national (Tableau 9) qui montre l'ordre de préférence des régions administratives algériennes, on peut distinguer trois catégories: la catégorie des régions les plus préférées, les moyennement préférées et la catégorie des régions non préférées.

La préférence pour la région Hauts Plateaux Est et la région Capitale se confirme ici puisque sur les deux périodes, ces deux régions font partie de la catégorie la plus préférée des migrants algériens. La deuxième catégorie est la moyennement préférée, elle contient trois régions: la région Hauts Plateaux Ouest, la région Nord-Ouest, et la région Nord-Est; ces régions sont les plus changeantes, le Nord-Est, qui est en troisième place lors de la première période, perd deux rangs durant la seconde période. La troisième catégorie est la moins ou non préférée, elle regroupe la région Hauts Plateaux Centre et les trois régions du sud du pays. Cela pourrait s'expliquer par les conditions climatiques non favorables, le grand manque des équipements et des infrastructures de base.

Tableau 9

Indice de préférence national en Algérie (1987–1998 et 1998–2008)

	RÉGION	**Indice de préférence (1987–1998)**		**RÉGION**	**Indice de préférence (1998–2008)**
1	Les Hauts Plateaux Est	0,0672	1	Les Hauts Plateaux Est	0,0706
2	Le Nord-Centre	0,0634	2	Le Nord-Centre	0,0559
3	Le Nord-Est	0,0458	3	Les Hauts Plateaux Ouest	0,0451
4	Les Hauts Plateaux Ouest	0,0395	4	Le Nord-Ouest	0,0409
5	Le Nord-Ouest	0,0356	5	Le Nord-Est	0,0395
6	Le Sud-Est	0,0180	6	Le Sud-Est	0,0234
7	Les Hauts Plateaux Centre	0,0172	7	Les Hauts Plateaux Centre	0,0211
8	Le Sud-Ouest	0,0147	8	Le Sud-Ouest	0,0136
9	Le Hoggar-Tassili	0,0025	9	Le Hoggar-Tassili	0,0054

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

Les résultats de l'indice de préférence montrent que la notion de distance est le facteur le plus important dans le choix de la région de destination. En effet pour toutes les régions administratives de l'Algérie, la région préférée est toujours une région limitrophe. Ceci confirme la première loi de

Ravenstein qui stipule que souvent, les migrants choisissent les régions voisines ou les régions les plus proches de leur région d'origine (Ravenstein, 1976).

4.5. L'impact des flux migratoires sur la redistribution de la population

Après l'analyse de l'intensité et la concentration des flux migratoires et leur orientation spatiale, nous devons connaître si les mouvements migratoires entre les 9 régions administratives sont efficients en termes de redistribution spatiale de la population, sur le niveau régional et le niveau national (l'ensemble du système).

– L'efficience régionale

La région Capitale est la seule région du territoire qui a connu une amélioration importante dans son efficience, mais les échanges restent non efficients. En effet, si dans la première période l'efficience de la région Capitale était -0,05, celui-ci passe à 0,207 dans la seconde période, signifiant qu'à chaque 100 mouvements migratoires entre cette région et le reste des régions du système, la région Capitale perd 5 habitants dans la première période, mais elle gagne 20 habitants dans la seconde période.

Les deux régions du nord ont une variation dans leur efficience, la région Nord-Est a une efficience négative, c'est-à-dire qu'elle connaît davantage de sortants qu'elle ne compte d'entrants, contrairement à la région Nord-Ouest qui a une efficience positive; l'efficience de la première région passe de -0.0195 à -0.1128 dans la seconde période par rapport à la région Nord-Ouest qui passe de 0.2993 à 0.1603 (Tableau 10).

Les trois régions de la zone géographique des Hauts Plateaux ont toutes des efficiences négatives, surtout dans la seconde période où les échanges sont les plus efficients. En effet, l'efficience de la région Hauts Plateaux Centre passe de 0,0716 à -0,0756, la région Hauts Plateaux Est passe de -0,0951 à -0,2809 et la région Hauts Plateaux Ouest passe de -0,1606 à -0,2613. Cela signifie qu'à chaque 100 mouvements migratoires sur la période qui s'étend de 1998 à 2008, les trois régions perdent plus d'habitants, 7 habitants pour la première région, 28 habitants pour la deuxième région et 26 habitants pour la dernière région.

Tableau 10

Efficience migratoire des régions administratives en Algérie (1987–1998 et 1998–2008)

REGION	Efficience (1987–1998)	Efficience (1998–2008)
Le Nord-Centre – région Capitale – **(N.C)**	**-0,0500**	**0,2070**
Le Nord-Est **(N.E)**	**-0,0195**	**-0,1128**
Le Nord-Ouest **(N.O)**	**0,2993**	**0,1603**
Les Hauts Plateaux Centre **(H.P.C)**	**0,0716**	**-0,0750**
Les Hauts Plateaux Est **(H.P.E)**	**-0,0951**	**-0,2809**
Les Hauts Plateaux Ouest **(H.P.O)**	**-0,1606**	**-0,2613**
Le Sud-Est **(S.E)**	**0,2474**	**0,0495**
Le Sud-Ouest **(S.O)**	**-0,4512**	**0,1199**
Le Hoggar-Tassili **(H-T)**	**0,2873**	**0,2482**

(Source: Traitement d'auteurs sur la base des données d'ONS, Données Statistiques N° 331/2001 et Collections Statistiques N° 159/2011 Série S).

Contrairement aux régions de la zone géographique des Hauts Plateaux, les régions du Sud ont toutes des efficiences positives, c'est-à-dire qu'elles reçoivent davantage d'entrants qu'elles ne comptent de sortants. Aussi, pour l'efficience qui devient moindre dans la deuxième période, car elle passe de 0,2474 à 0,0495 pour le Sud-Est, pour le Sud-Ouest, elle passe de -0,4512 à 0,1199 et pour la région Hoggar-Tassili elle passe de 0,2573 à 0,2482.

– L'efficience nationale

L'efficience nationale permet de savoir si les flux migratoires d'un territoire ou l'ensemble d'un système sont efficients et dans quelle mesure. Au cours des deux périodes de l'étude, l'efficience ne varie pas beaucoup. Entre 1987–1998 l'efficience est de 0,1427, signifie que pour 100 mouvements migratoires, il y a 14 habitants qui changent de région. Puis, à la deuxième période, les mouvements migratoires sont plus efficients, il y a une augmentation jusqu'à 0,1776. La redistribution entre les

régions administratives est un peu plus élevée, mais elle reste toujours loin des objectifs de la politique de l'aménagement du territoire en Algérie.

5. CONCLUSION

Le déséquilibre entre les nouvelles régions se manifeste par l'inégalité dans la répartition du nombre de wilayas et de population entre les régions, où leur concentration diminue au fur et à mesure qu'on se dirige vers le sud.

La migration interne en Algérie a connu une grande diminution à travers les deux périodes 1987–1998 et 1998–2008. Elle est observée non seulement entre les régions, mais aussi entre les wilayas et les communes. Comme on peut remarquer que sur les deux périodes, la majorité des flux migratoires se fait au niveau de la commune, ce qui montre que les migrants choisissent les régions les plus proches de leur région d'origine. Cela confirme la première loi de Ravenstein, qui stipule que souvent, les migrants choisissent les régions voisines ou les plus proches de leur région d'origine.

Le taux de migration net interne des régions a enregistré une grande évolution, en particulier dans trois régions. Ainsi, celui de la région des Hauts Plateaux Centre devient négatif durant la dernière période, contrairement à la première période, tandis que la région Sud-Ouest a enregistré un taux de migration net positif durant la dernière période, inversement à la période précédente. Cependant, le changement le plus important est celui remarqué au niveau de la troisième région, celle du Nord-Centre (région Capitale), en effet, après avoir enregistré un taux de migration net négatif dans la période de 1987–1998, elle est devenue la région la plus attractive dans la seconde période 1998-2008. En conséquence, la grande attractivité se fait par les régions du Nord.

L'étude de concentration et de dispersion des flux migratoires entrants et sortants pour chaque région à travers le calcul de coefficient de Gini a montré que sur les deux périodes les résultats étaient très proches pour presque toutes les régions. La concentration des sortants des régions est remarquable dans les régions du nord et les régions des Haut Plateaux. Sauf la région Capitale, où se trouve une dispersion des sortants, cette déconcentration est due à l'existence de plusieurs choix de régions d'accueil.

En ce qui concerne l'étude des destinations préférées des flux migratoires à travers toutes les régions, les résultats de l'indice de préférence a montré que la notion de distance est le facteur le plus important dans le choix de la région de destination. En effet, pour tous les sortants des régions administratives de l'Algérie, la région préférée est toujours une région limitrophe. Ceci confirme encore une fois la première loi de Ravenstein. En plus, pour l'ensemble du système, les régions préférées des migrants étaient la région du Nord-Centre et la région des Hauts Plateaux Est.

L'analyse de la redistribution de la population sur le territoire national à travers l'indice de l'efficience a montré que les flux migratoires internes étaient faiblement efficients durant les deux périodes, malgré l'augmentation de cet indice pour la deuxième période, c'est-à-dire 14 habitants pour 100 mouvements migratoires qui changent de région pour la première période, et puis 17 habitants pour 100 mouvements migratoires dans la deuxième période.

Les flux migratoires de l'ensemble des régions du territoire algérien se font plus souvent du sud vers le nord, et sont moins efficients, ce que signifie que la redistribution de la population est toujours très loin, et parfois contre des objectifs de la politique de l'aménagement du territoire en Algérie. Ce dernier vise à redistribuer la population et à l'orienter vers le Sud afin d'atteindre un équilibre régional et national. De ce point de vue, et afin d'atteindre l'équilibre souhaité, il est nécessaire d'élargir et d'approfondir les études sur le phénomène de la migration interne, et les prendre en compte lors de la mise en place des politiques d'aménagement du territoire et de développement en Algérie.

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MUSEUM DEVELOPMENT IN BOSNIA AND HERZEGOVINA AS AN INDICATOR OF THE POSITIVE SOCIO-CULTURAL IMPACT OF TOURISM

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Key-words: museums, tourism, development, visitation, socio-cultural benefits.

Abstract. Museum development is a side effect of tourism development since museums are significant components of cultural and tourist infrastructure, and tourism encourages infrastructure development in general. In Bosnia and Herzegovina, where tourism is a critical sector of the economy with a decades-long flow, the pattern of comparative development of tourism and museums has been recognized. The study provides a comparative review of the country's tourism and museum development, showcasing the multiple benefits of tourism and museums. Museums are one of the most important socio-cultural benefits of tourism because they preserve and present heritage, improve science, education, and cultural profiling, encourage employment and visitation, provide a better stay, generate income, and contribute to environmental urbanization and higher living standards. The identification of museums and museum resources revealed that, during the past three decades, approximately thirty museums of a predominantly thematic character have been established, particularly in the country's most visited destination (Sarajevo). Furthermore, an open-air museum (ethno-village) trend has begun. Museum visitation is increasing in tandem with tourist trips to the country, despite a lack of adequate monitoring (incomplete figures that are inconsistent with the situation in the field). Despite the fact that the global crisis disrupted tourism and museum development (COVID-19), both areas are key drivers of economic revitalization, as evidenced by new ideas and projects in this field. However, in addition to the benefits of increased museum activity, the study highlighted certain issues (e.g., lower engagement of professional staff and women, etc.), which will encourage future research to provide more sustainable strategies for museum development.

1. INTRODUCTION

Tourism stimulates the development of the overall infrastructure, including cultural infrastructure, which includes museums as an essential component. "Cultural infrastructure means the buildings, structures, and spaces where culture is consumed: places where culture is experienced, participated in, showcased, exhibited, or sold; for example, museums, galleries, etc." (London Government, UK). According to Bedi (2013), cultural infrastructure includes various cultural facilities such as concert halls, museums, libraries, theateres, etc. "Cultural infrastructure comprises museums, performing art centres, etc." (AEA Consulting). As a result, museums are an important component of the cultural infrastructure system. "The museum is a non-profit, productive permanent institution open to the public that collects, conserves, researches, communicates, and exhibits material evidence of people and their environment for the purposes of study, education, and entertainment. Museums promote social cohesion, civic participation, and municipal development by encouraging creativity, fostering cultural diversity, attracting visitors, and generating revenue" (ICOM, 2022; Sebuliba, 2020; Perera, 2013). Tourism contributes to the improvement of cultural and public life in tourist destinations, which is counted among the positive socio-cultural impacts of tourism. One of the most significant socio-cultural benefits of tourism, according to Leung *et al.* (2015), is the development of tangible and intangible cultural infrastructure. According to Košić (2012), socio-cultural impacts imply that tourism alters culture and lifestyle, as well as increases local engagement in cultural

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activities and events. According to Kreag (2001), tourism helps preserve local cultural identity and generates demand for cultural exhibitions. According to Zhuang *et al.* (2019), tourism, among other things, increases the range of recreational activities, improves local culture and the quality of the urban environment. According to S.M. Frone and D.F. Frone (2013), tourism creates an "urbanizing" effect on the destination. Museums are cultural attractions that are common in urban tourist destinations; hence, an increase in the number of museums helps the urbanization of a specific region or country. At the same time, museums are an important part of the tourism supply as well as one of the foremost institutions for promoting national heritage and local culture. According to Tien, museums are cultural products that attract tourists. Culture has emerged as a critical feature in cities' efforts to attract tourists as well as an important component of the tertiary sector. "Museums have distinctive features, rich content, flexible accessibility, a variety of exhibitions and restaurants, making them the ideal location to accommodate the diverse demands of visitors" (Žunić, 2022). According to Kotler, "museums have a strong link to tourism, since tourists are part of the audience and, for some museums, even a large part of the total number of visitors" (Perera, 2013). "Museums in the United States sustain about half a million jobs, generate approximately fifty billion dollars per year, have the greatest impact on the tourism industry, and have a substantial economic impact on every state, particularly California, New York, and Texas" (Žunić, 2023). Following contemporary trends and tourist demand, along with the boom of tourism in Bosnia and Herzegovina, a positive rising trend of museums, primarily thematic ones, has been registered in the past three decades, particularly in the area of the capital (Sarajevo), also the most visited tourist destination in the country. According to the Tourism Association of Canton Sarajevo, Sarajevo is the most visited destination in Bosnia and Herzegovina, accounting for more than one-third of the overall tourist traffic, with museums among the most popular attractions. "Tourism has emerged as the fastest-growing and most important economic sector in Bosnia and Herzegovina. Foreign visitor arrivals increased by roughly 10% per year after the war, with a 25% increase in 2015 (in the first five months) setting an absolute post-war record" (Boom in BiH tourism, 2015). "In 2019, the country had the third-highest tourism growth rate in the world, and tourism contributed more than $456 million to the economy" (USAID). A substantial link between the expansion of tourism and museum activities in Bosnia and Herzegovina will be demonstrated by the research' results.

2. METHODOLOGY

The aim of the paper is to investigate the increase in the number of museum activities in tandem with the growth of tourism in Bosnia and Herzegovina. Museums are acknowledged as a beneficial socio-cultural influence on tourism in Bosnia and Herzegovina since they are an important component of the cultural and tourist infrastructure. As a result, a large number of primary and secondary materials, such as relevant literature and the author's own field and cartography work, were used for this study. The research objectives are as follows: a) theoretically identifying museums as socio-cultural tourism benefits and regarding museums as a tourist product; b) a comparative examination of the statistical indicators of tourism and museum development in Bosnia and Herzegovina; c) investigating the concept of museum in Bosnia and Herzegovina, including the development patterns, and identifying the newly established museums in the post-war period (after 1995), as well as classifying museums using typological examples. Furthermore, field and topographical observations, along with official museum dataset statistics, were used to identify new museums in the country. The interview with museum workers (5) and the survey of museum visitors (100) in Bosnia and Herzegovina's capital provided more empirical evidence of the museum's tourist significance. The study's findings demonstrate the common link between the rise of tourism and the development of museum activities in the country, but the decade-long continuity was disrupted by the global

pandemic. Despite this, ongoing attempts are underway to develop new museums and expand Bosnia and Herzegovina's museums as tourist products.

3. RESULTS AND DISCUSSIONS

3.1. The Geographic Profile of Bosnia and Herzegovina with Museum Development Basics

Bosnia and Herzegovina is located on the western Balkan peninsula in Southeastern Europe *(land: 51,187 sq. km; water: 10 sq. km)* and shares borders with three countries (Croatia, Serbia, Montenegro). According to the estimates of the Agency for Statistics of Bosnia and Herzegovina, the country has a total population of 3.453.000 (Demography, 2021) and a multiethnic composition; according to the latest Census (2013), Bosnia and Herzegovina is home to: Bosniaks (50.1%), Serbs (30.8%), Croats (15.4%), and other minorities: Jewish people, Rroma, Albanians, etc. (3.7%). "Bosnia and Herzegovina is a developing country with a dominant tertiary-sector economy, including tourism as one of its strategic activities. It's a *"blooming"* tourist destination with a significant rate of tourism growth. From an administrative point of view, Bosnia and Herzegovina is made up of two entities (the Federation of Bosnia and Herzegovina, the Republic of Srpska) and Brčko District" (Žunić, 2023), and is frequently referred to as "the world's most complicated system of government" (Nardelli *et al.*, 2014). The capital of Bosnia and Herzegovina is Sarajevo, often called "*the Jerusalem of Europe*" due to its multiethnicity, as well as the most visited tourist destination in the country. Important regional centres include Banja Luka and Mostar (the second-most visited destinations in the country), while other cities significant from a tourism point of view include East Sarajevo, Tuzla, Bihać, Travnik, Trebinje, Neum, Medjugorje, Zenica, etc.

The first concepts and initiatives for developing a museum network in Bosnia and Herzegovina emerged in the middle of the nineteenth century. During the Ottoman period, for example, Fra Ivan Franjo Jukić campaigned for the establishment of a Bosnian museum (1850), and Baron Helfert advocated for the establishment of a Sarajevo Museum (1870), among others. The first museum in Bosnia and Herzegovina, however, was established four decades later, during Austro-Hungarian governance, in 1888 in Sarajevo, as an expression of public organization and the institutionalization of museum activity by the state. The Museum of the Humac Franciscan Monastery in Ljubuško (1884), the Museum of the Old Orthodox Church in Sarajevo (1889), the Museum of Vrbaska Banovina in Banja Luka (1930), and others followed. The National Museum (Sarajevo) and the Museum of Vrbaska Banovina (Banja Luka) were the only two museums in Bosnia and Herzegovina in the early days following World War II (1945), when a favourable trend began regarding museum activities. The Museum of National Liberation of Bosnia and Herzegovina (1945), the Art Gallery of Bosnia and Herzegovina (1946), and the Museum of Sarajevo (1949) were among the first museums in the country, followed by numerous other museums, museum collections, and museum memorial houses, resulting in a relatively large and extensive network of museums in the country. The museum's progress was halted by the war (1992–1995), which caused the museum to collapse as many objects and collections were lost, leaving the museum with severe problems: devastated objects and an unconditioned working environment, a lack of professional staff, political negotiations due to the complicated administrative structure of the country, pending legal status and financing, normative and nomenclature transformations with such examples as changing the museum's name: the Museum of Vrbaska Banovina (1930) was renamed the Museum of the Republic of Srpska (1992); the National Liberation Museum of Bosnia and Herzegovina (1945) was renamed the Historical Museum of Bosnia and Herzegovina (1993), etc.

Despite the problems mentioned, Bosnia and Herzegovina has recorded a positive trend of establishing new museums, primarily thematic ones, in the past three decades (since gaining state independence in 1992); Sarajevo, the capital and the country's most important cultural and tourist destination, leads in terms of total number. "Following the war, tourism development in Bosnia and Herzegovina encouraged the establishment and building of numerous cultural and educational institutions, particularly museums of various themes, which remain an important part of the tourism supply" (Žunić, 2022). From 1992 to 2022, 30 new museums were identified in Bosnia and Herzegovina; the majority of the overall number of museums, approximately 73%, was created in the Federation of Bosnia and Herzegovina, primarily in the destination of Sarajevo, where 40% of the total number of newly created museums was set up. Numerous conferences, round tables etc. are presently being conducted in Sarajevo and throughout Bosnia and Herzegovina, where new ideas and concepts are presented practically daily with the goal of developing more thematic museums; for example, the intention is to construct a Technical Museum in Sarajevo (industrial landscapes), among others.

The pink polygon on the map of Bosnia and Herzegovina's museums shows their densest concentration in the capital city; thus, the cartographic extract on the right side of the state map shows the most important museums in Sarajevo, the majority of which were established recently (for example, the Museum of Crimes against Humanity and Genocide) (Fig. 1). The majority of new museums are themed; however, the "National Museum in Sarajevo" is a general-purpose museum. It was Bosnia's first national museum (founded in 1888), and it serves as an important part of the country's Austro-Hungarian cultural and historical heritage.

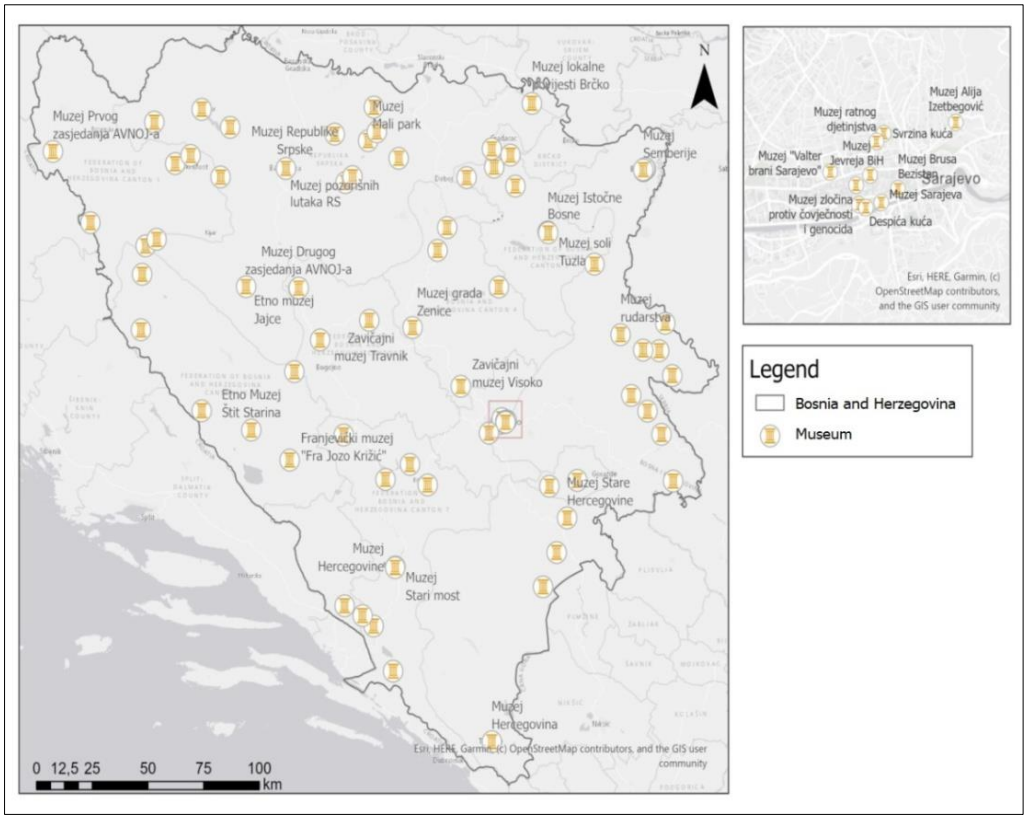

Fig. 1 – Spatial dispersion of Bosnia and Herzegovina's museums.
Source*:* Authors.

3.2. The Key Aspects of Tourism Growth in Bosnia and Herzegovina

Tourism in Bosnia and Herzegovina is on the rise, thanks to the vast tourist potential of the country's natural and cultural assets. The tourist supply involves cultural, religious, health (balneological), event, and, more recently, natural tourism (ecotourism) products. According to estimates, cultural-historical heritage accounts for 50% of the entire structure of the national tourist product, with museums standing as the major promoters and animators of cultural heritage.

According to the World Travel and Tourism Council (2022), tourism accounted for 9.7% of total GDP in 2019, as well as for 10.7% of total jobs. Bosnia and Herzegovina experienced a decade of steady tourism growth (2009–2019), mostly in terms of arrivals and revenue (with few oscillations); a substantial drop in visitors and income in 2020 is the result of COVID-19.

Figure 2 depicts a decade of continuous tourism development in Bosnia and Herzegovina, from 2009 to 2019. The number of visitors rose from around 300,000 in 2009 to over a million in 2019. The significant decline in 2020 is a classic result of the global COVID-19 pandemic, as a result of constrained mobility and travel restrictions both within and outside the country.

According to the Figure 3, Bosnia and Herzegovina's tourism revenue reached USD 438 million in 2020, compared with USD 1.3 billion in the previous year. The increase in tourism receipts was largely positive during the observed 2009–2020 period, with two oscillation intervals being recorded: a) 2009–2014 and b) 2019–2020. Administrative fraud (tax evasion, overnight stay irregularities, particularly in private accommodation, poorly regulated tourist statistics etc.) could explain the revenue decline in the first separated interval (2009–2014), whereas the economic and tourist crises caused by the global pandemic are possible causes of the decline in the second interval (2019–2020). "In 2020, however, the COVID-19 pandemic decreased tourism revenues by more than 85% and hampered the sector's development" (USAID).

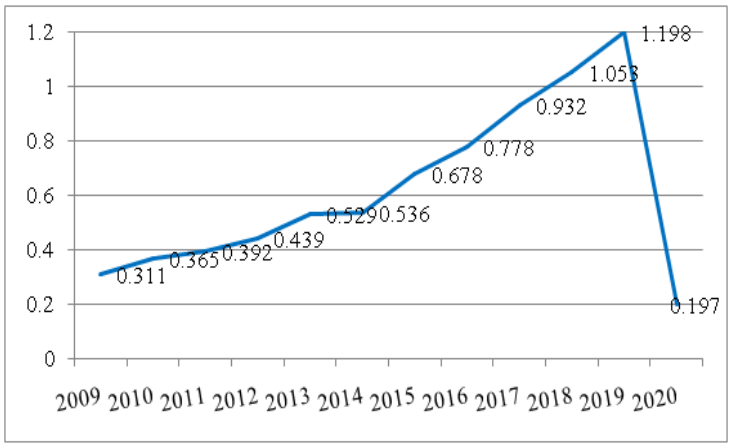

Fig. 2 – Increase in the number of international arrivals in Bosnia and Herzegovina for the 2010–2020 period (millions).
Source*:* Authors, adapted according to CEIC data (the China Economic Database: Global Economic Data, Indicators, Charts & Forecasts).

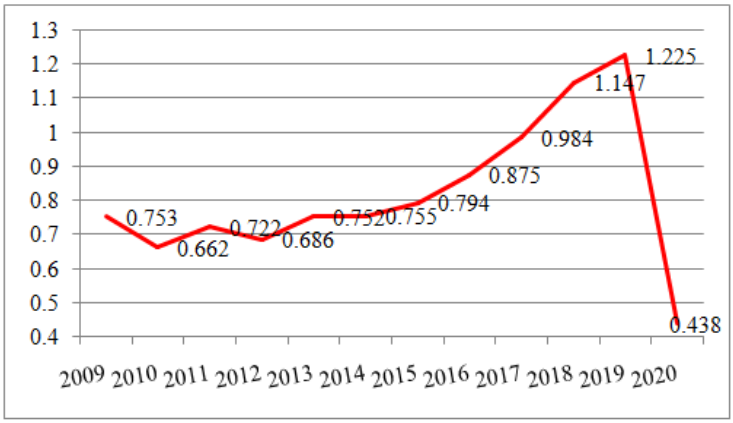

Fig. 3 – Increase in the number of international tourist receipts to Bosnia and Herzegovina for the 2010–2020 period (billions).
Source*:* Authors, adapted according to CEIC data.

A continuous increase in the number of tourists and overnight stays was established by performing a comparative examination of roughly presented tourism statistical data for the 2012–2022 decade. In 2022, a record 1.5 million visits and 3.2 million overnight stays were recorded. There are oscillations in foreign overnight stays and the average length of a stay, all reaching a peak in 2017 (foreign visitors stay longer). Income has steadily increased, reaching "209 million USD in 2021" (Linker Report) (Table 1).

Table 1

Growth in tourism flows in Bosnia and Herzegovina for the 2017–2022 period

Year	Visitors	Overnight stays	Foreign overnight stays	Average length of stays	Revenue (USD million)
2012	747,827	1.645,621	57%	3.5	686
2017	1.307,319	2.677,125	72%	3.7	984
2022	1.464,216	3.194,681	62%	2.2	N/D

Source*:* Authors, adapted according to the Agency for Statistics of Bosnia and Herzegovina and CEIC data.

Tourists from SE Europe (Serbia, Croatia, Slovenia), Germany, the UAE, Turkey, and Saudi Arabia lead the way in the structure of overnight stays by international tourists (54.3% in total) (Fig. 4). "In terms of the average length of stay by foreign tourists, Kuwait ranks first with an average stay of 3.8 nights, followed by Ireland with 3.3 nights, Iran with 3.2 nights, and the United Arab Emirates, France, and Egypt each with 3 nights" (Agency for Statistics of Bosnia and Herzegovina).

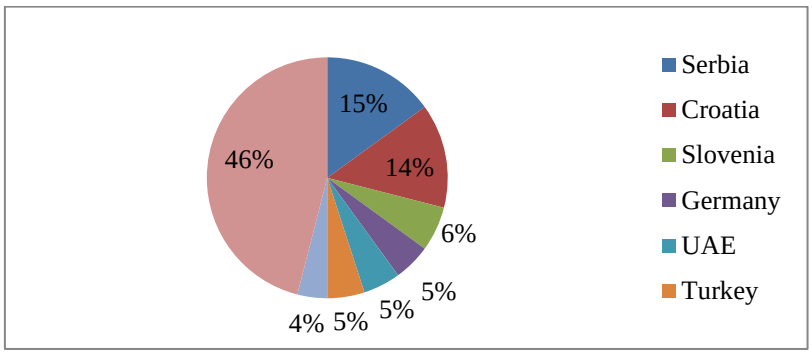

Fig. 4 – Overnight stays in Bosnia and Herzegovina in 2022.
Source: Authors, adapted according to the BHAS data (Agency for Statistics of Bosnia and Herzegovina).

International tourism export revenues in Bosnia and Herzegovina amount to 6.3% in 2020, a drop from over 15% in 2019. International tourism expenditure in 2020 was USD 112 million, down from USD 285 million in 2019.

3.3. The Concept of Museum Activity in Bosnia and Herzegovina

Museum activity in Bosnia and Herzegovina is governed by legal acts at the entities (the Federation of Bosnia and Herzegovina, Republic of Srpska) and Brčko district levels, and generally includes: the purchase, collection, protection, research, communication, and exhibition of civilizational, cultural, tangible, intangible, and natural goods for the purposes of study, education, and entertainment; their professional and scientific processing and systematization into collections; the permanent preservation of museum materials, museum documentation, and museum-presented heritage sites and deposits; the interpretation and presentation to the public through various forms of communication in real and virtual environments. The museum's primary functions include collecting, preserving, exhibitioning, scientific investigating, publishing, and animating. Museums (public institutions that perform museum-type activities), galleries (public or private museums), and exhibition galleries (lacking their own collections but having public cultural exhibitions) are all examples of museum activity in Bosnia and Herzegovina.

In general, museum categorization in literature (Gob, Drouguet, 2007; Leka, 2017; Maroević, 1993; Perić, 2011; The Law of Museum Activities in Bosnia and Herzegovina; AIM) is based on a variety of aspects: content (general-multidisciplinary, and thematic-specialized); accommodation type and its location (e.g., in facilities or outdoors; facility: purpose-built, authentic facility, adapted, etc.); management and ownership (state, private); museum size (geographic area; number of visitors; the number of artefacts; the number of collections and items; the number of exhibitions; the size of the exhibition space, etc.); the geographical location and spatial significance of the museum (international, national, regional, local); the tourist significance of the museum (depending on the number of visits and tourist reviews). For instance, according to the Association of Independent Museums (AIM), museums can be classified as: small: <10.000, medium: 10.001–50.000, and large: 50.001+.

Museums in Bosnia and Herzegovina are mainly divided according to thematic content:

1) *General-purpose museums* feature numerous thematically distinct collections that refer to a smaller or larger geographic location (town, city, entity);

2) *Specialized museums* gather a certain sort of material and can be: socio-historical, natural history, economic and technological, or artistic (art galleries using museum contents are referred to as museums).

According to official data in the Federation of Bosnia and Herzegovina, there are more general purpose museums than specialized museums (67:33%). However, museums in the RS are not classified according to a rough classification, but only according to the type of museum collection.

According to the Rulebook for the Establishment and Operation of Museums, Museum Collections, Museum Exhibitions, and Galleries (Official Gazette of the Canton of Sarajevo, No. 13/17), museums are classified by purpose (exhibition space, education, museum documentation, customer relations, welcoming new museum items, etc.) and access regime (open, closed, semi-open).

The museum's content, according to the Rulebook on the Content and Method of Keeping Museum Records (2021), comprises civilizational, cultural, and natural assets as part of the national and global human heritage. Museum artefacts and documentation have been declared cultural assets and consequently fall under the purview of cultural preservation legislation. Items from museums that have been gathered into collections of museum artefacts are referred to as museum content. Collections of museum items are united by one or more common features, such as structure, period, style, author, school, revolution, theme, subject, event, territory, medium, method, technology, scientific discipline, specific human activity, and so on. Museum collections are divided into categories such as natural history, history, archaeology, numismatics, ethnology, ethnomusicology, art, and so on. The fundus (collective fund) of the museum is comprised of all collections of museum artefacts. The Federation of Bosnia and Herzegovina has more museums, collections, and artefacts than the Republic of Srpska (see the table below), with Sarajevo leading in terms of total museum structure. "Museums in the Sarajevo Canton are home to 50% of all the Federation of Bosnia and Herzegovina's museum collections and nearly four-fifths of all the Federation of Bosnia and Herzegovina's museum artefacts" (Institute for Statistics of the Federation of Bosnia and Herzegovina) (Table 2).

Table 2

Museum content by collection type (2021)

Collection	Number of collections	Number of items
Natural	31	2.421,835
Historical	26	82,459
Archaeological	34	131,203
Numismatics	7	21,999
Ethnological	41	35,896
Ethnomusicological	2	7,576
Art (Fine and Applied)	10	10,222
Periodical Sections	2	5,602
Literary publishings	20	360,139
Other	*12*	*24,106*

Source*:* Authors, according to the Agency for Statistics of Bosnia and Herzegovina.

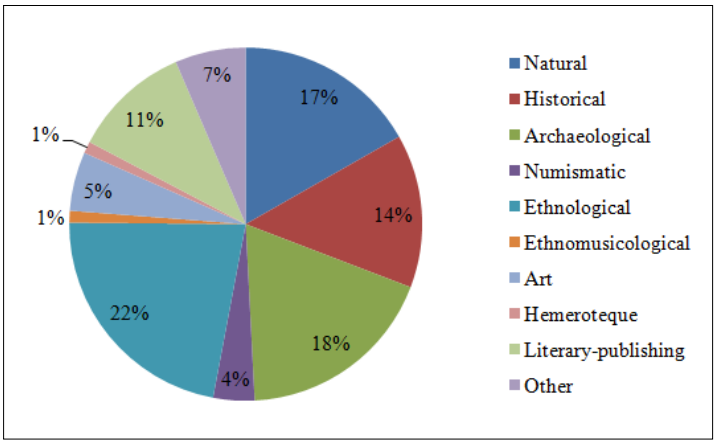

Fig. 5 – Bosnia & Herzegovina's museum collection structure.
Source*:* Authors.

3.4. Identification and Classification of Bosnia and Herzegovina Museums

Table 3

The museum identification in Bosnia and Herzegovina developed during the end of the 20th and early 21st centuries (1995–2022), with a focus on Sarajevo (in bold) and the "golden" decade of museums and tourism blossoming from 2009 to 2019 (in red)

Region	Museum title	Founded in
Federation of Bosnia and Herzegovina (FBiH)	***1. Sarajevo Tunnel of Hope***	***1995 (1993)***
	2. Franciscan Museum and Art Gallery Gorica-Livno	1995
	3. Bihać City Gallery	1998
	4. Museum of Sheikh Hadži Mesud Hadžimejlić	1999
	5. Ključ Museum Collection	2000
	6. Bosniak Institute – Adil Zulfikarpasic Foundation	***2001***
	7. "Baština" – Native collection, Novi Travnik	2004
	8. Enver Krupić, Bihać Gallery	2006
	9. Alija Izetbegović Museum	***2007***
	10. Sevdah Art House	***2008***
	11. Tešanj Museum	2009
	12. Jajce Ethno-museum	2010
	13. Museum of Gazi Husrev-bey	***2012***
	14. Gallery 11/07/95	***2012***
	15. Museum of Gazi Husrev-bey library	***2014***
	16. Sarajevo Brewery Museum	***2015***
	17. Kakanj Museum	2015
	18. Native museum, Goražde	2016
	19. Museum of Crimes Against Humanity and Genocide	***2016***
	20. War Childhood Museum	***2017***
	21. Museum of Optical Illusions	***2020***
	22. The Olympic Museum	***2020 (1984)***
Republic of Srpska (RS)	23. Donja Gradina – Concentration Camp Memorial Site	2003
	24. Mining museum, Milići	2009
	25. "Roman Municipium" Archaeological Museum	2010
	26. Museum of Puppets, Banja Luka	2013
	27. Semberija Museum	
	28. Ethno Village-Museum Ljubačke Doline	2015
Brčko District (BD)	29. Foundation/Legat Ekmečić, Brčko	2017
	30. Museum of Brčko district	2017

Source*:* Authors.

Table 4

Representation of new museums in Bosnia and Herzegovina by region in 2022

FBiH	***RS***	***BD***	**Total – BiH**	***Sarajevo***
22	*4*	*2*	28	*12*
73.3%	*20.0%*	*6.7%*	100%	*40.0%*

Source*:* Authors.

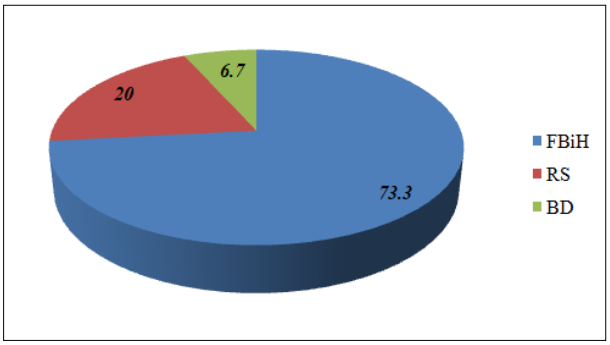

Fig. 6 – The regional distribution of new museums in Bosnia and Herzegovina.
Source*:* Authors.

Table 5

Museum classification with examples from Bosnia and Herzegovina

Category	**Example types**
Content/ theme	a) general, *e.g. The National Museum of Bosnia and Herzegovina* b) specialized, *e.g. Sarajevo Tunnel of Hope*
Accomodation	a) own building/ purpose-built, *e.g. The National Museum* b) adapted historical building, *e.g. Museum of Crimes & Genocide* c) authentic building, *e.g. Sarajevo Tunell of Hope* d) natural museum, *e.g. the National Museum botanical garden* e) open-air museum, *e.g. Ljubačevo Ethno-village*
Management & ownership	a) state museum, *e.g. The National Museum* b) private museum, *e.g. Ethno-village Ljubačevo*
Size (by number of visitors)	a) small: <10.000, *e.g. Tešanj Museum* b) medium: 10.001–50.000, *e.g. The National Museum* c) large: 50.001+, *e.g. Historical Museum of Bosnia and Herzegovina*
Spatial significance	a) national, *e.g. National Museum; Sarajevo Tunnel of Hope, etc.* b) regional, *e.g. Semberija Museum* c) local, *e.g. native museums (Tešanj, Kakanj, and so on)*
Tourist significance	a) number of visitors, *e.g. Historical Museum of BiH* b) tourism impressions (image & popularity), *e.g. Sarajevo Tunnel*

Source*:* Authors.

Fig. 7 – The oldest museum in Bosnia and Herzegovina: The National Museum (Austro-Hungarian heritage).
Source*:* Private Collection of Corresponding Author.

Fig. 8 – Sarajevo Tunnel of Hope – authentic museum building.
Source*:* Žunić, 2018.

The expansion of museums in Bosnia and Herzegovina is accompanied by a rise in museum employment.

Table 6

Employment structure in Bosnia and Herzegovina's museums by region (2012–2021)

Region	2012	2015	2017	2019	2021
Employees					
FBiH	148	182	195	203	104
RS	119	125	126	131	116
Total	*267*	*307*	*321*	*334*	*220*
Professional and scientific staff					
FBiH	77	84	75	34	64
RS	58	56	64	68	50
Total	*135*	*140*	*139*	*102*	*114*
Women					
FBiH	58	102	108	39	33
RS	71	73	77	79	67
Total	*129*	*175*	*185*	*118*	*100*

Source*:* Authors, adapted according to the Institute for Statistics of the Federation of Bosnia and Herzegovina and the Republic of Srpska Institute of Statistics.

Employment in Bosnia and Herzegovina museums recorded continuous growth between 2012 and 2019, which was mainly accompanied by an increase in the share of women in the total employment (2012–2017) (Table 6). The presence of women as part of the total museum employment numbers is at 45%, and higher in the RS than in the Federation of Bosnia and Herzegovina (67%:33%). However, the growth of professional and scientific staff employment has stagnated, which museum workers attribute to a policy of "saving" funds, a lack of facility space, and a lack of trained candidates. The real issue, however, is a failure to recognize adequate qualifications for work in the museum sector. Because certain transdisciplinary studies include subjects such as culture, ethnology, socio-geographical/cultural attractions, including museums, and so on, not all experts must be strictly culturologists (e.g., The Study of Tourism and Environmental Protection, Department for Geography, Faculty of Science, University of Sarajevo). Tourismologists, for example, are valuable professionals for interpreting heritage sites, and they should be encouraged to participate in museum activities.

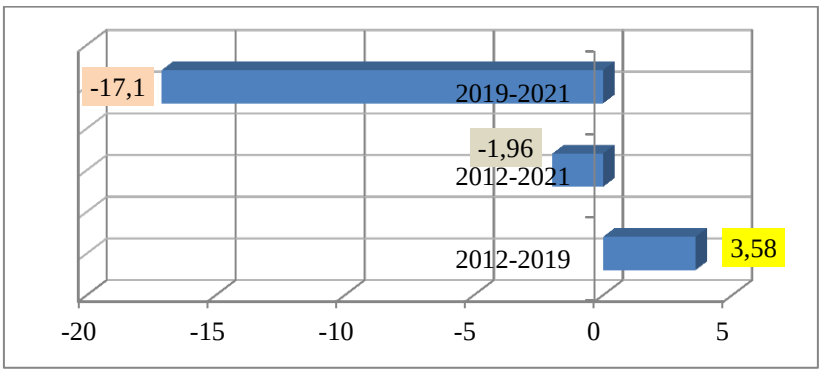

Fig. 9 – Employment growth rates in Bosnia and Herzegovina museums for the 2012–2021 period (%).
Source*:* Authors.

Employment in Bosnia and Herzegovina's museums (Fig. 9) developed at a positive rate of 3.58% from 2012 to 2019, with the sharp decline from 2019 to 2021 reflecting the global pandemic and economic crisis, resulting in a negative impact on many aspects of the economy, particularly tourism and culture. The average museum growth rate for the overall observed period (2012–2021) is negative (-1.96%), proving that the worldwide pandemic has considerably slowed the development of cultural activities in Bosnia and Herzegovina. The pandemic clearly had a negative impact on visits, with the number of visitors to museums exhibitions being reduced by half (e.g., in the Republic of Srpska, 2021: 42,637; 2019: 95,440). However, the demonstrated seven-year period of consistency in employment growth in museums coincided with the expansion of tourism in Bosnia and Herzegovina, highlighting the positive socio-cultural impact of the country's tourism development.

Table 7

Number of Bosnia and Herzegovina museums by region (2012–2021)

Region	2012	2015	2017	2019	2021
FBiH	10	14	11	11	12
RS	N/D	11	11	11	11
Brčko District	N/D	N/D	N/D	N/D	2
*Total**	*10*	*25*	*22*	*22*	*25*
*Total***	*N/D*	*25*	*20*	*22*	*20*

Source*: Authors, adapted according to data from the Institute for Statistics of the Federation of BiH and the Republic of Srpska Institute of Statistics, and data presented on Google Earth Maps – Brčko District.
Source**: Total number of museums according to the Agency for Statistics of Bosnia and Herzegovina.

The number of museums was higher at the conclusion of the observation period (2012–2021) (Table 7), providing more evidence for the expansion of cultural and museum activities in tandem with the development of tourism in Bosnia and Herzegovina. Oscillations and museum development stagnation in particular years were caused by the aforementioned issues that museums in Bosnia and Herzegovina face (devastated objects and scarce facilities, a lack of trained candidates and professional staff, political negotiations, property issue and financing, normative transformations, not recognizing or uninterested in recognizing the related qualifications for museum jobs). Political negotiations and budgeting concerns caused several museums in Bosnia and Herzegovina to close between 2012 and 2015, including the *National Museum of Bosnia and Herzegovina*. Inadequate working conditions were noted, including substandard desks, heating issues, insufficient staff, unpaid salaries, etc. Various sources (Jukić, 2012; Sindelar, Živković, 2012; Hooper, 2012; Pearce, Mujanović, 2014; Weisen, 2014; the Institute for War and Peace Reporting; Lozić, 2015) attribute the

museum issue to the following factors: the country's complicated administrative constitution (multiple tiers of government – state, entity, cantonal, and municipal), the authorities' split goals (different cultural groups have an interest in their own national cultural institutions), no ministry of culture at the state level, so there's no budgeting governmentally defined (cultural institutions have been financed from a variety of budgets, including those of the cantonal and entity ministries of culture and the State Ministry of Civil Affairs), and, generally, political tensions between two entities (the Federation of Bosnia and Herzegovina and the Republic of Srpska), as well as "the politicization of all spheres of Bosnia and Herzegovina's society, including the museums" (Lozić, 2015). However, the re-opening of the *National Museum* in 2015, "following an agreement between the different layers of Bosnia's complex government pledging financing for the museum" (Reuters, 2015), as well as the growing development of museums, particularly in the country's capital (Sarajevo has boosted its museum network; see Table 3), point to a positive socio-cultural impact of museums on Bosnian society and culture.

From the table above, it's also evident that certain museum statistics are a cause for concern. Bulletin data on the number and type of museums does not correspond to the actual situation; although some museums are managed as group subjects (e.g., *the Public Institution Museum of Sarajevo* includes five museums: Svrzo and Despića House, the Jewish Museum of Bosnia and Herzegovina, Brusa Bezistan, and the Museum of Sarajevo 1878–1918), terrain observations show that the country has more museum institutions than statistics are saying. Thematic museums are not relevantly enumerated in the Federation of Bosnia and Herzegovina (e.g., confusing criteria were applied for the classification of general and thematic museums, as the number of thematic museums evident through field work appeared much bigger than in the bulletins), while museums are not even categorically represented in the Republic of Srpska (there's only the museum collections classification). The degree of generality reveals disparities in the two entities' classification of museum material, collections, and exhibitions (e.g., museum content in the Federation of Bosnia and Herzegovina is roughly depicted into 5 thematic collections: natural, historical, archeologic, numismatic and ethnological, while in the Republic of Srpska there are 13 collections, but that is because they separate "ethnological" into ethnological, ethnographical, and ethno-musico-logical, etc.). Furthermore, the statistical data in the bulletins of both entities is not reconciled because they have various forms of records (for example, the statistical bulletin of the Republic of Srpska includes the number of visitors to museum exhibitions, although similar information is not available in the Federation of Bosnia and Herzegovina's bulletin). The bulletins mostly show a five-year series of data; however, it appears that there are inconsistencies regarding data for the same year (e.g., the number of museums in the Federation of Bosnia and Herzegovina for 2015 is different in the bulletins of 2016 and 2022, so the 2022 bulletin states that there are a total of 23 museums, while the 2016 bulletin mentions a total of 14 museums). According to the Agency for Statistics of Bosnia and Herzegovina, the total number of museums, in 2015, at state level is 25, so data regarding a smaller number of museums in the Federation of Bosnia and Herzegovina (14) has been noted, whereas it is consistently shown for the same year (11) in the Republic of Srpska. On the other hand, museum statistics in Bosnia and Herzegovina have not been conducted every year, consistently, making statistical analysis challenging because there is no continuous set of data. Despite the fact that the summarized data on museums in the state bulletin "*Culture and Art*" should be the result of data aggregation by entity, such as the statistical offices of the Federation of BiH (Federal Institute for Statistics), the Republic of Srpska (Institute for Statistics of the Republic of Srpska), and branch offices of the Agency for Statistics in the Brčko District of BiH, the authors' comparative analysis led to the conclusion that there are some inconsistencies (e.g., the total number of museums in the documents of the Agency for Statistics of Bosnia and Herzegovina is not fully compatible with the number of museums in the two entities' documents – *see the total number of museums marked in the table above with an asterisk* – the state museum value is lower than the number of museums in the two entities in 2017 and 2021). Therefore, both values were obtained by examining all three types of statistical bulletins (from the state level and the two entities' acts) and through re-calculation perfoermed by the authors.

According to the author's calculations and estimates, based on field and cartographic observations, including an examination of official data and their comparative analysis, the number of

museums in Bosnia and Herzegovina significantly exceeds the information in the bulletins because, just by identifying new museums founded between 1995 and 2022, 30 of them have already been established, which, when combined with the older museums (that operate on a regular basis), would lead to a significantly higher overall number.

Table 8

Number of Bosnia and Herzegovina museum collections by region (2012–2021)

Region	2012	2015	2017	2019	2021
FBiH	148	195	194	203	150
RS	119	125	126	131	106
Brčko Distrikt	N/D	N/D	N/D	N/D	N/D
Total	*267*	*320*	*321*	*334*	*256*

Source*:* Authors, adapted according to the Institute for Statistics of the Federation of Bosnia and Herzegovina and the Republic of Srpska Institute of Statistics.

Table 9

Number of Bosnia and Herzegovina museum units by region (2012–2021)

Region	2012	2015	2017	2019	2021
FBiH	333,798	1.700,428	1.555,889	3.475,827	3.326,208
RS	172,479	202,023	322,429	116,977	99,726
Brčko Distrikt	N/D	N/D	N/D	N/D	N/D
Total	*506,277*	*1.902,451*	*1.878,318*	*3.592,804*	*3.425,934*

Source*:* Authors, adapted according to the Institute for Statistics of the Federation of BiH and the Republic of Srpska Institute of Statistics.

According to the Tables 8 and 9, there has been a continuous growth in museum collections and museum items from 2012 to 2019 (excluding the decline between 2019 and 2021), providing further evidence for the expansion of cultural-museum activities in tandem with tourism expansion in Bosnia and Herzegovina, with the primary goal of expanding representative contents and enhancing museums, as well as tourist supply. In terms of the number of museums and total museum materials, the Federation of Bosnia and Herzegovina outnumbers the territorially slightly smaller entity the Republic of Srpska.

3.5. Tourism and the Socio-Cultural Significance of Bosnia and Herzegovina Museums

According to Future Market Insights, the museum tourism market is estimated at USD 20.0 billion in 2022, and is expected to reach USD 35.0 billion by 2032, at a CAGR of 13% from 2022 to 2032 (Museum Tourism Market Outlook, 2022–2023). Museum tourism is mainly motivated by a desire to learn about culture and tradition. It encourages effective learning about culture, art, and history. Museums preserve cultural values while also educating visitors about a country's distinct culture and historical events. They aid in comprehending the evolution of places and nations. Museums are thriving educational environments because they foster tangible and intangible heritage and bring history to life through innovative presentations and exhibitions. The new trends in Bosnia and Herzegovina also include the development of open-air museums (e.g., ethno-villages), which are "a scientific open-air collection of various types of structures illustrating settlement patterns, dwellings, economies, and technology" (AEOM, Association of European Open Air Museums). Domestic and foreign visitors, as well as educational institutions, boost museum tourism as a result of their significant educational role in aspects of culture, art, and tradition. "With a rise in trends regarding learning about historic events specially at educational level there is a rise in the participation rate of educational institutions in museum tourism" (Museum Tourism Market Outlook, 2022–2023). Museum are among the most important components of tourism industry, particularly in cities.

"Museums are some of tourists' favorite choice. With the rising trend in heritage and cultural tourism, travelers are more attracted to museums. Museums, with their unique artefacts, are attracting tourists all over the world. The growing importance of this trend is driving the museum tourism market" (Museum Tourism Market Outlook, 2022–2023) (Fig. 10).

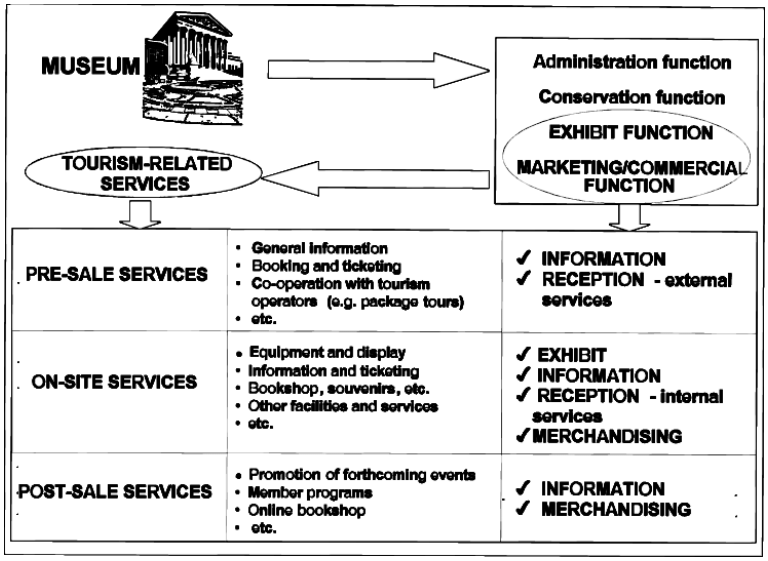

Fig. 10 – Museum functions as tourist services.
Source*:* Minghetti, Moretti, Micelli (2001).

The majority of museums in Bosnia and Herzegovina (approximately 60%) evolved during the country's *"blooming"* tourism decade (2009–2019), emphasizing the country's need to improve culturally and boost its tourist supply with further museums. The top museums in the country are ranked by the total number of visitors (Table 10).

According to the data in the Table 10, Sarajevo museums are the most visited among all the museums in Bosnia and Herzegovina, since they are part of the capital, situated in the city centre, and serve as the focal point of tourist activities (e.g., the Historical Museum of Bosnia and Herzegovina etc.). For instance, the *Historical Museum of BiH* is located near the National Museum; it was founded in 1945, at the close of World War II, as a symbol of the country's liberation from fascism, and it is also known for its extensive numismatic collection from medieval Bosnia, among other things.

Table 10

Top visited Bosnia and Herzegovina museums in the period 2014–2017 (total entries)

Museum	Location/ City	2014	2015	2017
Historical museum of Bosnia and Herzegovina	Sarajevo	12,484	87,390	68,600
Museum of Contemporary Art of Republic of Srpska	Banja Luka	18,718	36,589	66,877
Museum of Sarajevo	Sarajevo	/	59,500	51,200
The National Museum of Bosnia and Herzegovina	Sarajevo	/	/	32,518
Museum of Republic of Srpska	Banja Luka	/	/	26,900
Museum of Zenica	Zenica	/	86,230	/
Museum of Travnik	Travnik	34,950	38,690	/
Museum of the Battle for the Wounded at Neretva	Jablanica	25,000	/	/
Museum of Herzegovina	Mostar	11,325	/	/

Source*:* Authors, adapted according to data of EGMUS.

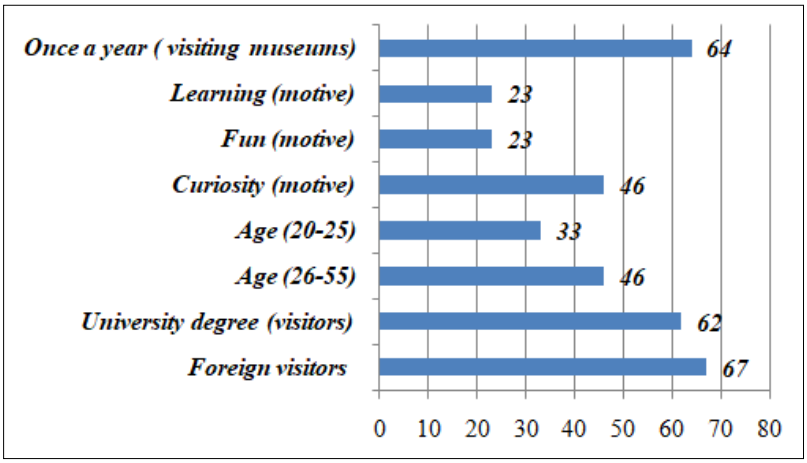

Fig. 11 – Structure, frequency and motives for visiting the Sarajevo museums (dmnt. respondence).
Source*:* Authors, the survey results (2022).

According to the authors' survey data collected in Sarajevo at the entrance of five museums (open-ended questionnaire, 2022; random sample; 100 museum visitors), international tourists account for two-thirds of the total number of museum visits (67%), with Italy (18%) and Germany (10%) being the most frequent countries of origin. The majority of museum visitors are adults, aged 26–55 (46%), followed by students aged 20–25 (33%). The educational structure of museum visitors is dominated by highly educated people (62%), stressing the educational role of museums and their significance for permanent education (the more educated we are, the more eager we are to learn new things). Curiosity (46%), followed by a desire to learn (23%), having fun (23%), and so on, is the main motivation for visiting museums (Fig. 11). Curiosity and relaxation are two of the most essential drivers of tourism in general, while education is a byproduct of every new experience in a tourist destination. Museums, with their tourist-recreational and educational objectives, also arouse curiosity while providing delightful and beneficial entertainment. Approximately two-thirds (64%) of tourists visit museums in Bosnia and Herzegovina once a year during their annual vacation on tourist trips and tours. The empirical findings demonstrate the cohesion between museums and tourism, implying that museums are a required attraction during a tourist's stay in urban, as well as other types of tourism destinations.

4. CONCLUSIONS

The study's findings, using Bosnia and Herzegovina as an example, illustrate the development of museums as a reliable indication of the positive socio-cultural implications of tourism. Bosnia and Herzegovina prioritized the development of the service industry, particularly tourism, as well as the establishment of museum infrastructure, recognizing the critical role that museums play in the tourist supply. Museums are a key component of the cultural and tourist infrastructure, since they are a tourist product that serves several functions (entertainment, relaxation, education, and so on). Museums are developed not only for the benefit of tourists and higher income, but also for the benefit of the local population, as much for promoting culture, a more entertaining life, supplementary learning, and so on, as for encouraging employment opportunities in the museum industry, thus contributing to the overall strengthening of the cultural and economic sector. The outcomes of this study acknowledged and supported a concurrent trend of an increasing number of tourist visits and revenue on the one hand, and an increase in the employment rate and the number of museum visits on the other hand.

Entities (the Federation of Bosnia and Herzegovina, the Republic of Srpska) can monitor the progress of museum activity, but no statistics are readily available for the Brčko District, which should be given special future consideration. Both entities (the Federation of BiH and the Republic of Srpska) invest in the development of museum resources, with the Federation of Bosnia and Herzegovina leading in this regard and the state capital (Sarajevo) leading the way in museum expansion. However, the current number of museum employees in Bosnia and Herzegovina is higher in the Republic of Srspaka than in the Federation of Bosnia and Herzegovina, indicating a more developed awareness of the importance of valuing museum staff even during the global crisis (due to COVID-19, the tourism and museum sectors experienced significant declines in visitor numbers, income, and employment, particularly in the Federation of Bosnia and Herzegovina). Museum development is particularly significant in terms of ethics and equality of rights with regards to gender representation in overall employment because museum occupations tend to be less physically demanding, making them a tempting prospect for female employment. Bosnia and Herzegovina has achieved a relatively sustainable equilibrium at the state level, though men are still predominantly represented in the museum industry (M 55%; F 45%). However, at entity level, there is a significant disparity in the gender structure of museum employees, with more than two-thirds being women in the Republic of Srpska and only one-third of this gender in the Federation of Bosnia and Herzegovina, which should be taken into account when developing a dynamic employment plan that adheres to gender policy principles. Furthermore, qualified personnel, particularly professional experts and scientists, must be encouraged to apply. Despite the global pandemic crisis and a general decline in the tourism and museum industries, Bosnia and Herzegovina strives to revitalize tourist-museum products, as evidenced by ongoing projects; new thematic museums (e.g., technogenic) are being planned, and an emerging trend of establishing open-air museums (e.g., ethno-villages) has also been identified. Thus, the facts stated imply that museum expansion will continue in tandem with the blooming tourism industry in Bosnia and Herzegovina, which is currently a vital economic activity in this small but colourful Balkan country. The expansion of tourism and museums in Bosnia and Herzegovina will continue to benefit the country's economy, urban environment, and overall quality of life, but it will also demand more sustainable museum development strategies. Political intolerance can pose a risk to the development of cultural activities because adverse effects have already been identified, such as the relative stagnation of museum development in the middle of the studied period. However, because museums are the main driver of social cohesion and cultural exchange, a more sensible collaboration between the authorities at all levels is anticipated in this field. Museum statistics and a more appropriate museum identification at the state level, as well as a networked monitoring of the visitation rate, should be the emphasis of future museum growth.

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SUSTAINABLE WATER MANAGEMENT AND ELIMINATION OF WATER SCARCITY: A CASE STUDY IN A REMOTE DISTRICT OF UZBEKISTAN

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Key-words: water scarcity, geography, sustainability, irrigation, Central Asia.

Gestion durable de l'eau et élimination de la pénurie d'eau : l'étude de cas dans un district éloigné de l'Ouzbékistan. La diminution significative du niveau d'eau de la mer d'Aral au cours des cinquante dernières années représente un défi environnemental majeur en Asie centrale. L'Ouzbékistan, autrefois riche en ressources hydriques, doit désormais faire face à la menace de pénurie d'eau dans des zones spécifiques. La mauvaise gestion de l'irrigation est devenue un contributeur important aux problèmes environnementaux mondiaux. Cette étude examine les problèmes liés à la mauvaise gestion de l'irrigation dans les zones rurales d'une province méridionale éloignée de l'Ouzbékistan. L'objectif principal de cette étude est de développer des solutions pratiques pour résoudre efficacement le problème urgent de pénurie d'eau dans la région ciblée. L'étude met en avant l'importance de la planification stratégique et de mesures proactives pour établir une base solide en vue d'une durabilité à long terme au niveau local. Cette étude n'examine pas l'effet de la variabilité climatique mondiale sur la diminution des réservoirs d'eau en Ouzbékistan. Les conclusions de l'étude s'alignent sur les efforts de recherche mondiaux, contribuant ainsi au discours plus large sur la gestion durable de l'eau. Cette recherche a le potentiel de transcender les frontières, de partager les bénéfices avec des études de cas similaires et de promouvoir l'alignement des stratégies liées à l'eau à l'échelle mondiale.

1. INTRODUCTION

The global challenge of water scarcity and its complex management requires careful consideration. Severe climatic events, especially droughts, have a significant impact on both the quality and quantity of water, which highlights the need to urgently address the negative consequences of these events (Swain, 2016). The importance of addressing the negative consequences of water scarcity is emphasized (Mitrică *et al.*, 2017). Exploring potential socioeconomic scenarios for water users can facilitate the proactive anticipation and mitigation of the consequences of water scarcity, especially in the context of public water supply (Mitrică *et al.*, 2017). The consequences of global water scarcity also include the depletion of groundwater. The expansion of agriculture, which is closely linked to water, energy, and food policies contributes to unsustainable patterns of water and energy consumption (Mukherjee, 2020).

The importance of water as a crucial resource for both socioeconomic well-being and ecological balance is widely recognized. Prudent water resource management is crucial for development and has the potential to reduce poverty and inequality. The symbiotic relationship between human expertise and digital AI tools offers new opportunities to improve water efficiency through data-driven decision-making. This results in an agile and intelligent approach to dynamic planning for water resources (Xiang *et al.*, 2021).

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Striking a delicate balance between increasing water scarcity and the need for higher agricultural productivity is a crucial challenge. Geographical regions like India, China, the Western part of the US, and Palestine face complex water management challenges that go beyond traditional investments in irrigation infrastructure. The evolution of irrigation practices requires structural transformations, well-thought-out irrigation policies, and strategies to promote reduced consumption. This trajectory includes innovative methods such as desalination and wastewater reclamation, which are closely linked to water, energy, and food policies (Balasubramanya *et al.*, 2022). The successful implementation of these strategies relies on effectively managing geographical and logistical complexities, highlighting the complex nature of ensuring a reliable water supply.

Accurately assessing water scarcity is crucial for effective resource management. Although some studies have presented various indicators to measure this phenomenon, it remains difficult to find a single indicator that encompasses all its complex dimensions (Hussain *et al.*, 2022). Conventional benchmarks, while informative, often fail to capture important nuances such as the neglect of green water, the interconnectedness of water scarcity and quality, temporal fluctuations, ecological water flow requirements, and virtual water transfers.

The Middle East, Saudi Arabia in particular, stands out as a prime example of the intersection between water scarcity and sustainable development on a global scale. Escalating groundwater extraction and energy-intensive desalination methods worsens the severity of the water crisis, requiring immediate and ongoing interventions. Navigating the complex framework of water resource management requires comprehensive strategies that include conservation efforts, technological advancements, fair pricing mechanisms, and regulatory frameworks (Alotaibi *et al.*, 2023).

The issue of mismanaged irrigation in Uzbekistan represents a small part of the larger problem of global water scarcity. Sustainable water management requires a deep understanding of both local and international dynamics, guided by global insights. The dramatic decline of the Aral Sea serves as a powerful example of how water scarcity can devastate a local environment (Hamidov *et al.*, 2020). The desiccation of this once-thriving water body has had a significant impact on Central Asia, particularly Uzbekistan. This concerning trend has led to water scarcity in regions that were once rich in water resources (Khasanov *et al.*, 2022). The significant role of poorly managed irrigation practices in worsening the water scarcity crisis cannot be ignored, even in the face of global environmental factors (Huang *et al.*, 2023). This study does not directly examine the impact of global warming on the reduction of water resources in Uzbekistan. However, it does provide insight into water scarcity in the specific context of Oltinsoy (i.e., *Golden Stream*), a remote district within the Surkhandarya province (Figs. 1 & 2). This district, known for its flourishing vineyards, faces challenges such as soil erosion and declining agricultural yields caused by inadequate water resources. The misallocation of water resources, especially in relation to local agriculture, is a significant concern (Satorov, 2022). The pressing water crisis in this district highlights the need for immediate community action.

This article highlights the crucial role of geographical analysis in understanding the complex water challenges in Uzbekistan, specifically in the mentioned district. This article explores Uzbekistan's water challenges from a geographical and environmental perspective, highlighting the importance of communication networks in connecting local governance with the community and raising awareness about water scarcity. The study focuses on the challenges caused by poorly managed irrigation in a water-scarce area of Uzbekistan. By conducting a localized case study that combines insights from both local and global contexts, this study aims to contribute to the global discussion on water scarcity. Additionally, it emphasizes the importance of sustainable water management strategies in addressing this crisis. The research aims to identify the causes of irrigation mismanagement, address challenges specific to each district, and propose solutions to alleviate water scarcity. This study serves as a call to action, reminding us of the collective effort needed to ensure a sustainable water future for Uzbekistan.

2. THEORETICAL BACKGROUND

The water shortage in the chosen area for this study shares similarities with other water problems around the world. The situation has similarities to the Aral Sea crisis, which has crossed national borders and gained the interest of neighbouring countries. The Mekong River basin, like many other regions, faces complex interactions and conflicts over water distribution due to multiple nations relying on a shared water source (Gao *et al.*, 2022). The cases of the Aral Sea and Mekong River Basin demonstrate the negative consequences of mismanaging shared water resources, including ecological degradation and socioeconomic instability. These cases parallel the challenges faced in the Oltinsoy area.

The Integrated Water Resources Management (IWRM) approach is a geographically relevant theory with great potential for addressing water scarcity in Oltinsoy District. IWRM advocates for a holistic approach that incorporates social, economic, and environmental considerations in water resource management (Lenton & Muller, 2012). Given the intricate relationship between human activities and the natural systems that contribute to the water crisis in Oltinsoy, implementing the IWRM approach could offer a comprehensive framework for achieving sustainable water management (Grison *et al.*, 2023). This strategy aims to promote collaboration among stakeholders, such as local communities, government agencies, and environmental organizations, to address water scarcity and maintain ecological balance.

One effective solution to combat water scarcity is the implementation of rainwater harvesting systems. Rainwater capture and storage systems are widely recognized for their effectiveness. Rainwater harvesting could greatly supplement water sources and relieve pressure on groundwater reservoirs, particularly in arid climates. Rainwater harvesting is a sustainable practice that can help mitigate the impact of water scarcity on agricultural and domestic needs in Oltinsoy district.

Numerous international studies support the challenges discussed in this study. UNESCO's World Water Development Report highlights the global water crisis and emphasizes the importance of coordinated action (CDP Global Water Report, 2022). The United Nations Decade of Action "Water for Life" (2005–2015) also prioritized sustainable water management practices (Turok-Squire, 2022). These studies emphasize the importance of addressing water scarcity and offer valuable insights that can inform the strategies proposed in this study.

The specific focus of this study on water scarcity in Uzbekistan's Oltinsoy district provides valuable insight into the broader context of global water studies. Localized case studies, like this one, provide valuable insight into the intricate relationship between human activities and natural systems, shedding light on the complex nature of global water issues. This study provides valuable data and perspectives that enhance our understanding of global water-related issues by analysing challenges specific to a particular region. The proposed solutions and recommendations from this case study can serve as a blueprint for addressing water crises in different regions, thus improving the toolkit for global water management. This approach of applying lessons learned and best practices from local contexts to the global level will enable more effective and context-specific interventions to address global water scarcity.

3. STUDY AREA

Uzbekistan, located in Central Asia (Fig. 1), faces the challenge of water scarcity in its complex water landscape. The nation's water resources include renewable surface water, groundwater, wastewater, and drainage water generated by human activities (Jelen *et al.*, 2020).

Uzbekistan's water consumption is currently at 906 cubic meters per second, with 606 cubic meters per second coming from groundwater and 300 cubic meters per second from freshwater sources. The dynamic underground water reserve is a crucial aspect, reaching 1038.1 cubic meters per second in 2020. The transboundary Syr Darya and Amu Darya rivers are significant sources of surface water, collectively sustaining an average long-term flow of 114.4 cubic kilometres. The water system consists of 17,777 naturally flowing water sources, 9,930 of which are located within the Amu Darya basin. Additionally, Uzbekistan is home to 97 reservoirs with a total capacity of 64 million cubic meters.

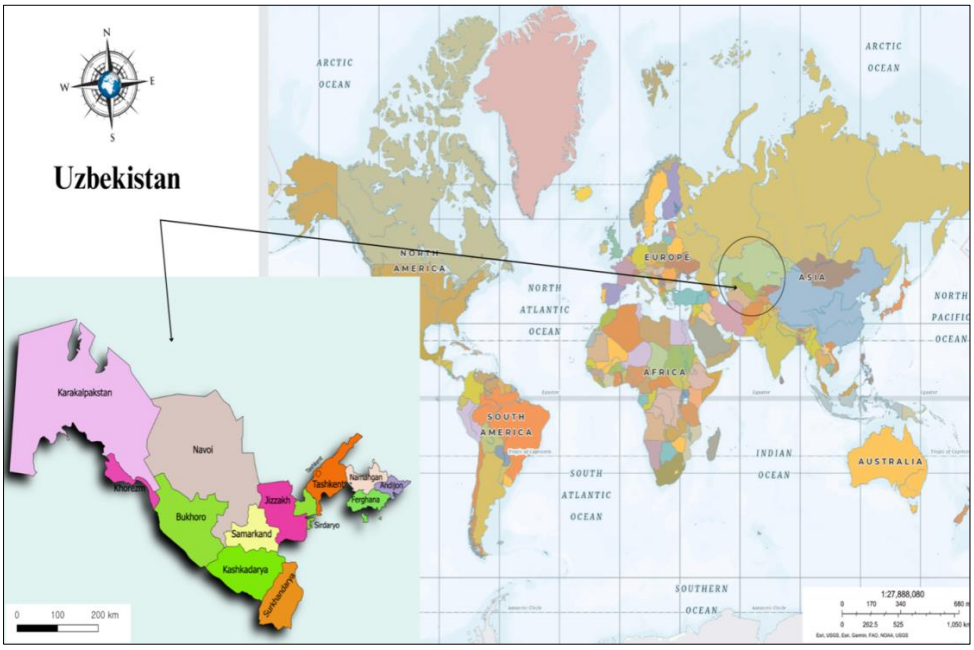

Fig. 1 – Map of Uzbekistan.

However, the water situation in Uzbekistan is complex. According to calculations by the Uzbek Water Supplement Joint Stock Corporation, current water resources range from 52 to 53 thousand cubic kilometres, while the population's water demands are around 62 thousand cubic kilometres. Despite achieving a commendable 71.2% centralized drinking water supply coverage by mid-2022, concerns remain due to a shortage of 6–8 thousand cubic kilometres of water faced by the growing population. This crisis is a result of inefficient irrigation practices and unregulated drinking water usage. Approximately 26,000 wells are used to access underground freshwater and slightly saline reservoirs, resulting in daily withdrawals of 75.5 million cubic meters. As of 2022, Uzbekistan's reservoirs hold a total of 9.6 billion cubic meters of water. Water resources are geographically unevenly distributed, having their origin in the mountains, but being primarily used in the plains through an extensive network of irrigation canals (Chathuranika *et al.*, 2022).

Geographical disparities in water availability are worsened by uneven distribution across different regions (Zhiltsov *et al.*, 2018). Water diversion measures are used to redirect water flow from one region to another, particularly on a large scale in the Amu Darya and Syr Darya river basins. The complex nature of the water crisis makes it difficult to find quick solutions. Uzbekistan ranks 25th out of 164 nations on the Water Scarcity Index, with 17 countries classified as "severely" water-scarce (USAID Global Waters, 2019). The availability of safe drinking water continues to be a critical concern. Agriculture takes up the majority of the nation's freshwater resources, accounting for 91.3 percent, or 53.5 billion cubic meters. Figure 2 clearly depicts the significant trend of water consumption. By early 2022, irrigation technologies had been adopted across 344,008 hectares of land, with a total water usage of 2.58 billion cubic meters (4.4 percent) for various purposes (Tsukhlo *et al.*, 2019).

Another important factor contributing to water scarcity is the significant waste of water, as highlighted by data and reports. In the capital city of Tashkent, daily water consumption per person can reach a peak of 330 litres. The city's water supply system, which provides 2.5 million cubic meters of drinking water daily, is facing a concerning 20 percent waste rate. By 2020, Uzbekistan had secured water reserves of 193,000 cubic meters per day, which is enough to meet the needs of 1,140 thousand people. Per capita water consumption ranges from 115 to 240 litres per day, which is below

the global average. However, according to Worldometers (2023), Uzbekistan has a staggering daily per capita water consumption of 4,754 litres.

In response to these challenges, the Uzbek government has taken proactive measures. The Cabinet of Ministers issued a decree on May 25, 2013, providing guidelines for sustainable and efficient water usage across various sectors. A resolution endorsed on May 10, 2022, outlined measures to ensure a reliable water supply for agricultural crops and mitigate the impact of water scarcity, in anticipation of future water scarcity. Moreover, Presidential Decree No. 5863, enacted on October 30, 2019, introduced the Concept of Environmental Protection of the Republic of Uzbekistan until 2030. This decree aims to address broader environmental concerns by implementing a comprehensive strategy for conservation and sustainability.

The ecological challenges associated with water scarcity in Uzbekistan's regions are caused by changes in river flows and irrigation practices (Green, 2001). The discharge of wastewater into rivers, especially the Amu Darya, is a major cause of water pollution (Tookey, 2007; Karthe *et al.*, 2017). While this study acknowledges these concerns, it emphasizes the importance of additional independent research to fully understand these complex issues. The widespread use of contaminated water for agriculture leads to soil salinization (Kulmatov *et al.*, 2015) and poses potential health risks, particularly in livestock irrigation (Crosa *et al.*, 2006). Neglecting water scarcity worsens the decline of the shallow water areas used for irrigation, especially when combined with ineffective water management practices (Jarsjö & Destouni, 2004). The increasing agricultural demands in the region exacerbate these problems. Declining clean water supplies and river contamination are leading private individuals and official farmers to rely more on groundwater, which causes soil salinization (Johansson *et al.*, 2009). Residents' grievances highlight the deterioration of groundwater quality. The Amu Darya watershed receives direct wastewater inflow, primarily from household toilets located near homes. This contamination of shallow groundwater is caused by the prevalence of basic latrines (Rakhmatullaev *et al.*, 2012). To overcome these challenges, a comprehensive approach is necessary, including an improved wastewater management, modern sanitation systems, and effective water resource management practices. International collaboration, knowledge exchange, and infrastructure investments play crucial roles in overcoming these challenges and ensuring equitable access to clean and safe water.

Oltinsoy district in Surkhandarya Province is a region where focused efforts are being made to address water scarcity. A decree by the Cabinet of Ministers titled *"Comprehensive Socio-Economic Development Measures of Oltinsoy District in Surkhandarya Province in 2020–2022"* has allocated 14.3 billion USD for the reconstruction and improvement of drinking water and wastewater networks in the region (Lex.Uz). International funding also supported the construction of a new pumping station, which can deliver 250–300 litres of water per second from the Hazorbog Canal. This was a crucial contribution to addressing water scarcity (Fig. 6).

The ecological challenges caused by water scarcity in Uzbekistan's regions can be attributed to changes in river flows and irrigation practices. This study recognizes these concerns and emphasizes the importance of additional independent research to fully understand these complex issues. The extensive use of contaminated water in agriculture has led to soil salinization (Kulmatov *et al.*, 2015) and potential health risks, especially in livestock irrigation (Crosa *et al.*, 2006). Neglecting water scarcity worsens the decline of shallow water areas used for irrigation, especially when combined with inadequate water management practices (Jarsjö and Destouni, 2004; Feng and Yamamoto, 2020). The increasing agricultural demands in the region exacerbate these issues. The decreasing availability of clean water and pollution in rivers has led private individuals and official farmers to depend more on groundwater, which has resulted in soil salinization (Johansson *et al.*, 2009). The grievances of residents highlight the decline in groundwater quality. The Amu Darya watershed is directly affected by wastewater inflow, mainly from household toilets located near homes. This contamination of

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4. MATERIALS AND METHODS

This study adopts a non-empirical approach and employs official documents and raw statistical data from reputable sources, such as the World Bank, the United Nations Development Program (UNDP) in Uzbekistan, and the Statistical Authority of the President of the Republic of Uzbekistan. The study ensures accuracy and reliability in analysing the water scarcity problem in Uzbekistan's Oltinsoy district by using credible and proven sources. The study materials include a wide range of reports, publications, and data sets on water resources, irrigation practices, environmental conditions, and socioeconomic factors in the region. These sources encompass a variety of data, such as historical records of water usage, irrigation methods, land use changes, climate patterns, and population trends. The main goal is to gather and analyse existing information un order to gain a valuable insight into the causes and effects of water scarcity in Oltinsoy district. The methodology used includes a comprehensive review and analysis of official documents and data sets. By employing data triangulation, researchers can identify patterns, trends, and correlations between factors such as water availability, agricultural practices, climatic conditions, and socioeconomic indicators. This study aims to provide a comprehensive overview of the complex interplay between various elements contributing to water scarcity in the region by making use of established data sources.

The findings of this study have significant implications for water issues at both local and global levels. Insight gained from analysing official documents and statistical data can provide valuable information about the specific challenges Oltinsoy district (the case study area) faces. The study contributes to informed decision-making processes at the local government level by identifying the causes of water scarcity. This can help in developing specific policies and strategies to enhance water management, encourage sustainable agricultural practices, and alleviate the effects of water scarcity on local communities.

The findings of this study are also relevant for global water management. The strategic use of existing data sources shows how local challenges can be tackled using readily accessible information. This study highlights the significance of collaboration among local institutions, international organizations, and government agencies in tackling water challenges. This collaboration not only enriches our understanding of local water issues but also contributes to the global conversation on sustainable water management practices.

5. CASE STUDY: WATER SCARCITY IN OLTINSOY DISTRICT

This case study examines the historical context, underlying factors, and consequences of water scarcity in the Oltinsoy district of Surkhandarya, the southernmost province of Uzbekistan (Fig. 2).

The study aims to comprehensively understand the complex challenge of water scarcity, including its origins and potential sustainable solutions. Oltinsoy district, which borders northern Afghanistan, covers an area of 570 square kilometres and has a population of around 180,200 residents as of 2021. The district, which consists of 14 urban and 9 rural (villages) settlements, is currently facing a significant environmental challenge caused by water shortage.

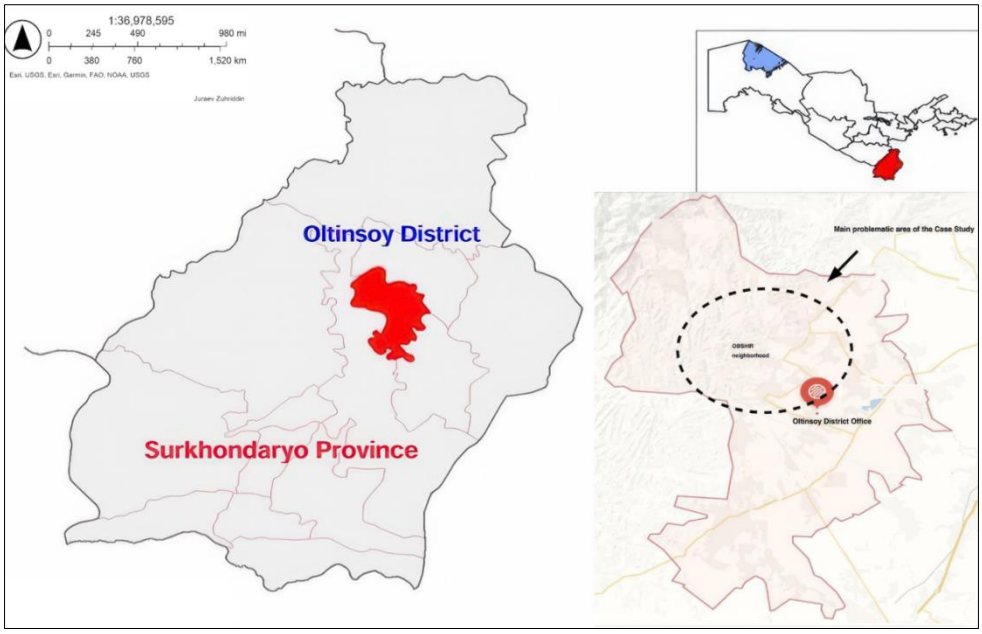

Fig. 2 – Map of the Case Study Area.
This district map also indicates the "Problematic area" in the Oltinsoy district.
Note: This Figure depicts a general view of the case study area and aids in understanding the locations depicted in other figures.

Despite ongoing efforts to improve transparency and international cooperation, obtaining comprehensive data on regional water scarcity remains challenging. The local statistical committees and government agencies have started developing comprehensive statistics on salinized soils, drainage resistance, agricultural water consumption, and their impact on the agricultural sector. The current data is obtained from social media platforms and informational-analytical documents provided by the Statistics Agency under the President of the Republic of Uzbekistan. These entities are actively improving data collection and reporting methods to better understand water scarcity dynamics in the region. To tackle the water scarcity issue in Oltinsoy district, a two-pronged approach is suggested (Fig. 2).

The modernization of the Oksuv pumping station is crucial. Upgrades and optimizations are necessary to improve pumping efficiency and capacity, ensuring a reliable and sustainable water supply to agricultural areas. Restoration efforts to clean and renovate a significant segment of the Chilmirob canal, extending to the Kyzilsu River, are crucial. Over time, sedimentation and debris accumulation have hindered the flow of water, requiring extensive cleaning and repairs. This rehabilitation project aims to improve water conveyance and ensure fair distribution in the designated regions. Implementing both strategies simultaneously provides a comprehensive solution. Modernizing the pumping station increases water pumping capacity while restoring the canal improves water conveyance and distribution. This ultimately leads to sustainable water management and provides support to the agricultural sector (Fig. 3).

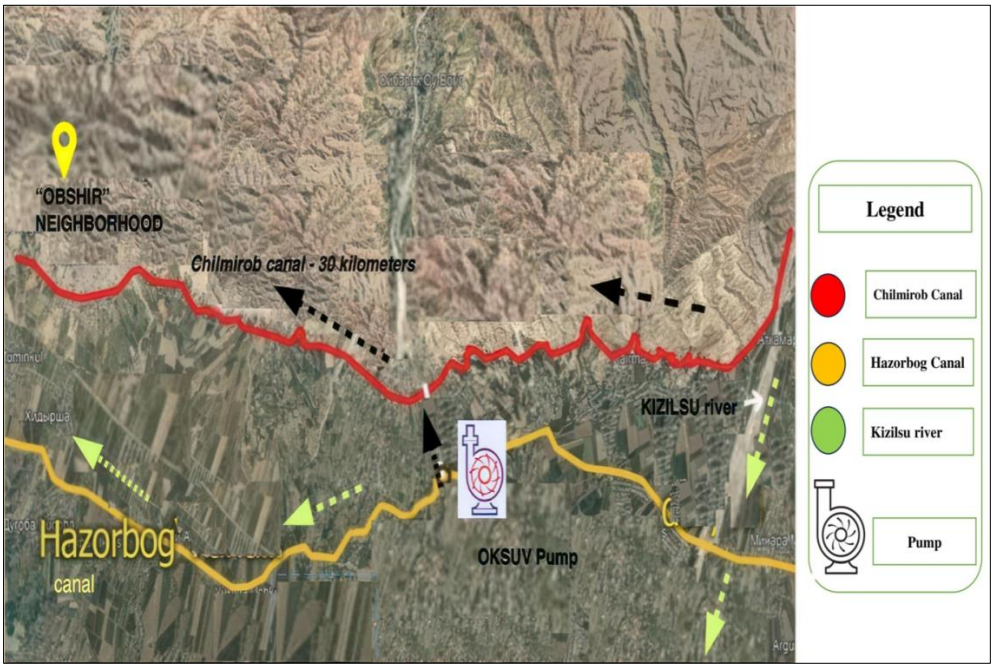

Fig. 3 – The disadvantage of controlling water.

A critical call for action is needed along a 20-kilometer stretch of the Chilmirob Canal, from the Oksuv pumping station to the diversion area on the Kyzilsu River. The deteriorating conditions of the river, including turbidity, flooding, and sediment deposition, have significantly affected the quality of life for residents in the upper Hazorbog Canal region. This issue has persisted throughout 2021. This study emphasizes the importance of recognizing the problem and finding a quick solution instead of assiging blame. The canal's water scarcity during the summer months negatively impacts crops in fields, gardens, and estates. Despite the district deputies' pleas to address the water quality problem, their concerns have been inexplicably ignored. Media narratives shed light on their difficult situation. In 2018, a commission was established to address the issue of water scarcity. However, its efforts were unsuccessful, leaving the problem of water shortage unresolved. Due to delays caused by governmental transitions, the construction of a new pumping station along the Hazorbog Canal took priority over the restoration of the Chilmirob Canal. This allocation of resources has been subject to public criticism, as investigated in this study and highlighted by online sources (KUN, 2022; Fig. 4).

District officials have extensively discussed their financial concerns regarding the construction of a new pump station. These concerns were also highlighted in online publications, indicating their importance in the analysis of the problem. After reviewing these sources, it was found that renovating the existing Oksuv pumping station is a more cost-effective option, requiring only half the investment compared to building a new facility. The proposal from a Russian industrial company to transport two pumps with a capacity of delivering 3 cubic meters of water per second to the Oksuv pumping station offers an economical solution. The decision to prioritize the water needs of the remote village of Obshir diverts attention from the crucial task of restoring the Chilmirob canal and supplying water to a larger area (Fig. 5).

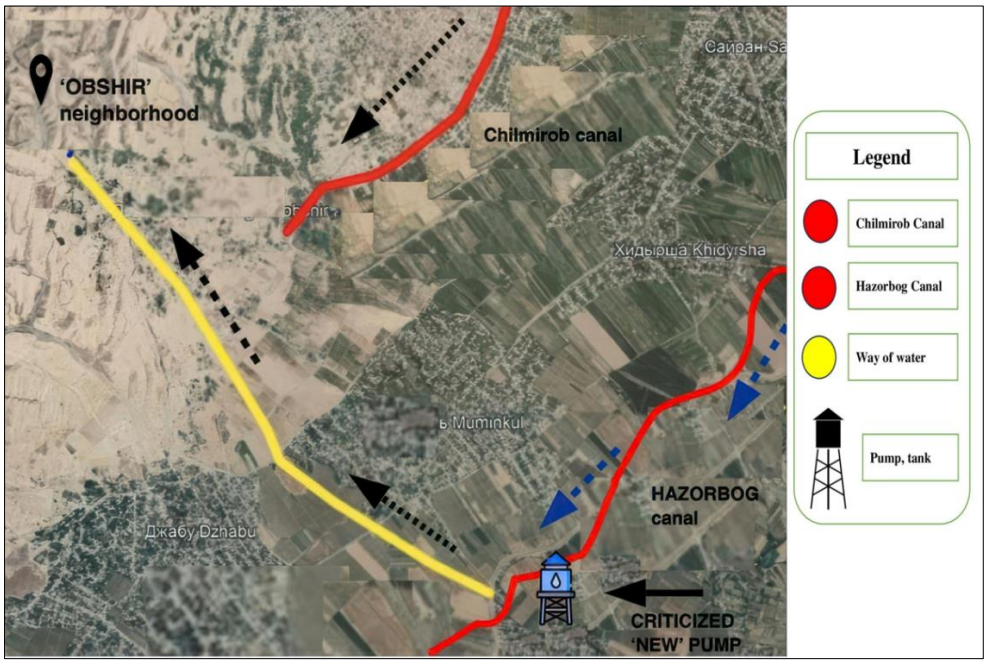

Fig. 4 – "Problematic" new pump.

Fig. 5 – Water tanks' view (Oltinsoy district).

The media has drawn attention to this location, prompting questions about the need to consider the broader context in decision-making. The presence of numerous private pumps along the Chilmirob Canal worsens water supply problems. This is evident from the activation of around 200 small private pumps, which depleted water reserves even when the Oksuv pumping station was functioning (KUN, 2021). Unauthorized construction of pumps by residents has exacerbated the problem, resulting in the destruction of houses, gardens, and trees.

Before the current water crisis, Uzbekistan had extensive vineyards and significant export-oriented grape cultivation. The lack of a comprehensive statistical database hampers the ability to accurately identify specific vineyard areas. Vineyards are already withering due to water scarcity. Some large vineyard plots have been converted into individual residences and farms. Drip irrigation systems have been installed in some fields to preserve the remaining vines, but their effectiveness is uncertain. The success of drip irrigation depends on the availability of underground water. Without sufficient irrigation, fields become completely dry. The Topalang reservoir, which provides drinking water, is facing challenges due to complaints regarding drying springs that have traditionally supplied drinking and domestic water. Online publications frequently report the widespread contamination of drinking water. The district municipality's project to build a drinking water network from the reservoir does not include provisions for supplying water to the residents of Oltinsoy district. The government's plan to provide clean drinking water to Surkhandarya province from 2022 to 2026 raises concerns with respect to unresolved water issues. The drinking water problem remains unaddressed while sewage systems are being constructed. The President has allocated 60 million USD to support the exploration of water supply from local springs (LEX, 2017).

Water scarcity has a significant impact on people's lives, causing a wide range of problems and challenges. The lack of safe drinking and irrigation water has a negative impact on health and well-being, especially for vulnerable groups like women and children, who are more susceptible to waterborne diseases (Hunter *et al.*, 2010). The impracticality of transporting water over long distances leaves residents dependent on inadequate sources, worsening issues related to water scarcity. The threat to public health and hygiene standards is significant, as over 80 percent of infectious diseases are caused by contaminated water (World Health Organization, 2022). According to experts, maintaining hygiene and a healthy lifestyle requires approximately 50 litres of water per person per day (Climate Promise, 2021).

Media narratives also emphasize the negative effects of water scarcity on living standards, specifically the rise in livestock diseases. Disputes regarding access to drinking and irrigation water have gained attention online, extending beyond Oltinsoy district. Reports of conflicts in neighbouring areas point to possible tensions within this area. Authorities and law enforcement handle these disputes, sometimes leading to violence and even deaths. Allegations have been made regarding deliberate actions to deny specific individuals access to water. Consequently, water-related disputes have become common, especially when significant agricultural investments are involved. The Ministry of Agriculture of the Republic of Uzbekistan responded by establishing a dedicated commission and providing regular monitoring updates through an official web report (2022). This study uses analytical texts from online publications to gain insight and contribute to a comprehensive understanding of the implications of water scarcity for the affected population.

6. DISCUSSION AND CONCLUSION

The water scarcity issue in Uzbekistan is of global significance and falls in line with current discussions in the integrated social and humanitarian sciences. The ecological crisis caused by poor water management and environmental factors leads to water scarcity in river basins, indicating the need for immediate ecosystem restoration and implementation of sustainable water policies. These findings contribute to ongoing discourses in ecology, urban planning, and cultural studies, and enrich the international literature on water issues and geographic studies.

This study contributes to the global discourse on sustainable development and the United Nations Sustainable Development Goals (SDGs). The integration of water resources management and ensuring equal access to clean water falls in line with SDG Goal 6 (please refer to www.onedrop.org), which focuses on making water and sanitation available and sustainably managed for everyone. This emphasizes the significance of effective water usage and the welfare of present and future generations. The geopolitical dimension of water scarcity highlights the significance of transboundary cooperation and diplomacy in promoting peace and stability. This aligns with the spatially integrated social

sciences' emphasis on resource allocation and international relations, and provides insights into ecological consequences such as biodiversity loss and desertification. These findings contribute to the field of environmental studies and emphasize the importance of ecosystem restoration and the integration of environmental factors into decision-making processes.

The urgency of addressing social inequalities and implementing inclusive socioeconomic policies is underscored by the impact of water scarcity on the most vulnerable individuals or groups within the population. This is consistent with the spatial dimensions of health and economic inequalities in the social sciences and humanities. The potential risks of internal conflict and social unrest arising from competition for limited water resources highlight the spatial dimensions of social and political dynamics. The book contributes to interdisciplinary debates in political science, sociology, and history.

This study emphasizes the importance of addressing water scarcity in Uzbekistan, specifically in Oltinsoy district. The proposed strategies offer a comprehensive framework to address the water crisis and ensure a sustainable future for water resources. Allocating sufficient state budget resources is a positive step, and optimizing their use is crucial. Several important observations, conclusions, and actionable recommendations emerge from a geographic and environmental perspective. The state budget has sufficient resources to address water scarcity, as demonstrated by the funding of specific projects. Suggested strategies to address scarcity include education, funding, legal oversight, and advanced technologies. It is essential to have a comprehensive change in consumption habits and monitor agricultural practices. It is recommended to make advances in waste processing and adopt innovative technologies, as well as implement water collection systems and collaborate with renewable energy companies.

Transparent regional statistical reporting and the use of geographic information systems (GIS) are essential for the development of effective policies. GIS can identify sources of water pollution and other environmental issues, promoting the sustainable use of resources. Scientific advancements are crucial for effective water resource management. By implementing these measures and promoting collaboration among stakeholders, Uzbekistan can overcome water scarcity challenges and secure a prosperous water future. The collaboration between government agencies, communities, and international partners is crucial in addressing this urgent environmental issue and ensuring sustainable water supplies for present and future generations. The multidimensional inquiry of this study contributes to the international literature on water issues and geographic studies, nurturing interdisciplinary dialogue within the spatially integrated social sciences and humanities.

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VILLAGE ECONOMIC DEVELOPMENT STRATEGIES THROUGH SUSTAINABLE VILLAGE-OWNED ENTERPRISES. THE GOLD MINING AREA IN WEST SUMBAWA, INDONESIA

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Key-words: Strategy, BUMDes, SWOT, Gold Mining Area, Indonesia.

Abstract. Village economic development itself is a process to improve the living conditions of all regions or certain countries so that there is equitable development in rural areas and increases the role of villages and Village-Owned Enterprises (BUMDes) in developing the rural economy in order to improve welfare. This study aims to formulate a village economic development strategy in a sustainable manner in the gold mining area of West Sumbawa through village-owned enterprises. SWOT is the method used. The results show that its strengths include: the existing BUMDes management, overwriting business resources, adequate human resources, a fulfilled business capital, strategic business locations in the middle of the community, and village income sources partly from BUMDes. Weaknesses include: BUMDes managers still lack expertise, limited business types, the limited quality of human resources, the limited capital during the Covid period, the limited infrastructure facilities and village innovations, as well as BUMDes Managers. Opportunities include local government support, enough abundant village potential, a fairly good community participation and internet network support. Threats include the still weak BUMDes business, the limited management motivation, the village party expectations against management, and local culture. Based on the results of the above data, the strategy formulation is as follows: the first strategy, where training needs to be performed to improve the skills of the village and managers, and the second strategy, which entails the application of entrepreneurial-based management skills. For the community, it is hoped that there will be increased participation in the BUMDes program.

1. INTRODUCTION

Rural economic development is a process which aims to improve the living conditions of an entire region or a certain country so that there is equitable development in rural areas, including the development of social and economic life of said areas. All villages canhave better economic growth and develop together, and villagers' income can increase. There is no longer an imbalance where developed villages and villages are left behind (Gao & Zhang, 2021).

According to the Central Bureau of Statistics, 83,843 villages in Indonesia have the opportunity to improve the welfare of the community (Yuliana *et al.*, 2019). The village funds allocated to improve the welfare of every village in Indonesia can be appropriately utilized and managed by village officials with high integrity.

One indicator of a village's economic development is the income of the population. about the income is appropriate or still far below the average (Effendi *et al.*, 2019). Villages are said to be developed when the population's income is above average, while villages are said to be left behind if the population's income is still far from sufficient. Village-owned enterprises (BUMDes) as an alternative model in village development (Ali, Agyekum & Adadi, 2021). The BUMDes empowerment model is through a Business Plan, a village economic development solution through participation,

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openness, accountability, sustainability and community enjoyment. BUMDes can prevent unemployment and poverty, create jobs and Village Original Income (PAD) (Azhari, 2019).

The existence of BUMDes in the community has inhibiting and supporting factors in Implementation. The inhibiting factors of BUMDes in the gold mining area are 1) the budget factor, 2) the Human Resources management factor, and 3) the limited support from the private sector. Supporting factors as reinforcement are 1) government commitment and 2) the availability of potential natural resources. The existence of inhibiting factors is related to the fact that many government programs are financed. Hard work is needed by BUMDes managers in developing businesses through creative and innovative programs to be competitive (Ali *et al.*, 2019; Ibrahim *et al.*, 2016).

The Government of the West Sumbawa District is currently encouraging various efforts to accelerate its people's welfare, both from social, economic and environmental aspects. One of them is by accelerating village development through various approaches. Villages are micro-autonomous government units in Indonesia that have original rights to manage the community's interests in the Implementation of village governance.

The latest development in the Sumbawa Barat district is village development (Table 1) and shows that the distribution of the 59 villages in the Sumbawa Barat district includes 28 developing villages, 27 developed villages and four independent villages.

Table 1

Distribution of village progress in Sumbawa Barat District 2020

District	Very disadvantaged	Left behind	Evolve	Forward	Independent
Brang Ene	0	0	3	3	0
Brang Rea	0	0	8	1	0
Jereweh	0	0	3	1	0
Maluk	0	0	0	3	2
Poto Tano	0	0	2	6	0
Sekongkang	0	0	2	4	1
Seteluk	0	0	4	5	1
Taliwang	0	0	6	2	0
Total	0	0	28	27	4

Source: Community Empowerment, Village Administration, Population and Civil Registration Office, 2022.

The challenge for the local authorities of the Sumbawa Barat District is how toaccelerate village development so that the village may become financially independent. The government inthis region continues to encourage the acceleration of village development through various approaches, which is not easy to achieve. Village governments and village communities face challenges at the field level.

Based on the above findings and field facts, it would be interesting to conduct further studies on village economic development strategies through sustainable Village-Owned Enterprises in the West Sumbawa District gold mining area.

2. METHODOLOGY

Data collection in the study was carried out in rural gold mining areas in the West Sumbawa District. This research location represents 3 (three) sub-districts included in the gold mining area: Jereweh, Maluk and Sekongkang sub-districts (Fig. 1).

Data is obtained from three sources, namely: from the direct observation of the economic activity process of BUMDes managers; through informants (sources) who are directly involved in the field as part of the BUMDes program; through stakeholder information on the respective village

parties who understand the conditions of the community and the implementation of the BUMDes program as well as related agencies.

This study's data collection was carried out using 4 (four) methods: observation, interviews, recording and registration. Data validity uses source triangulation techniques, while data analysis uses SWOT. This research consists of an internal examination such as strengths and weaknesses complete with the results of weight analysis, then an assessment and score of external factors is carried out which is an activity to determine opportunities and threats which is equipped with the results of weight analysis, assessments and scores. Decisions are made based on the results of the collaboration of internal and external factors.

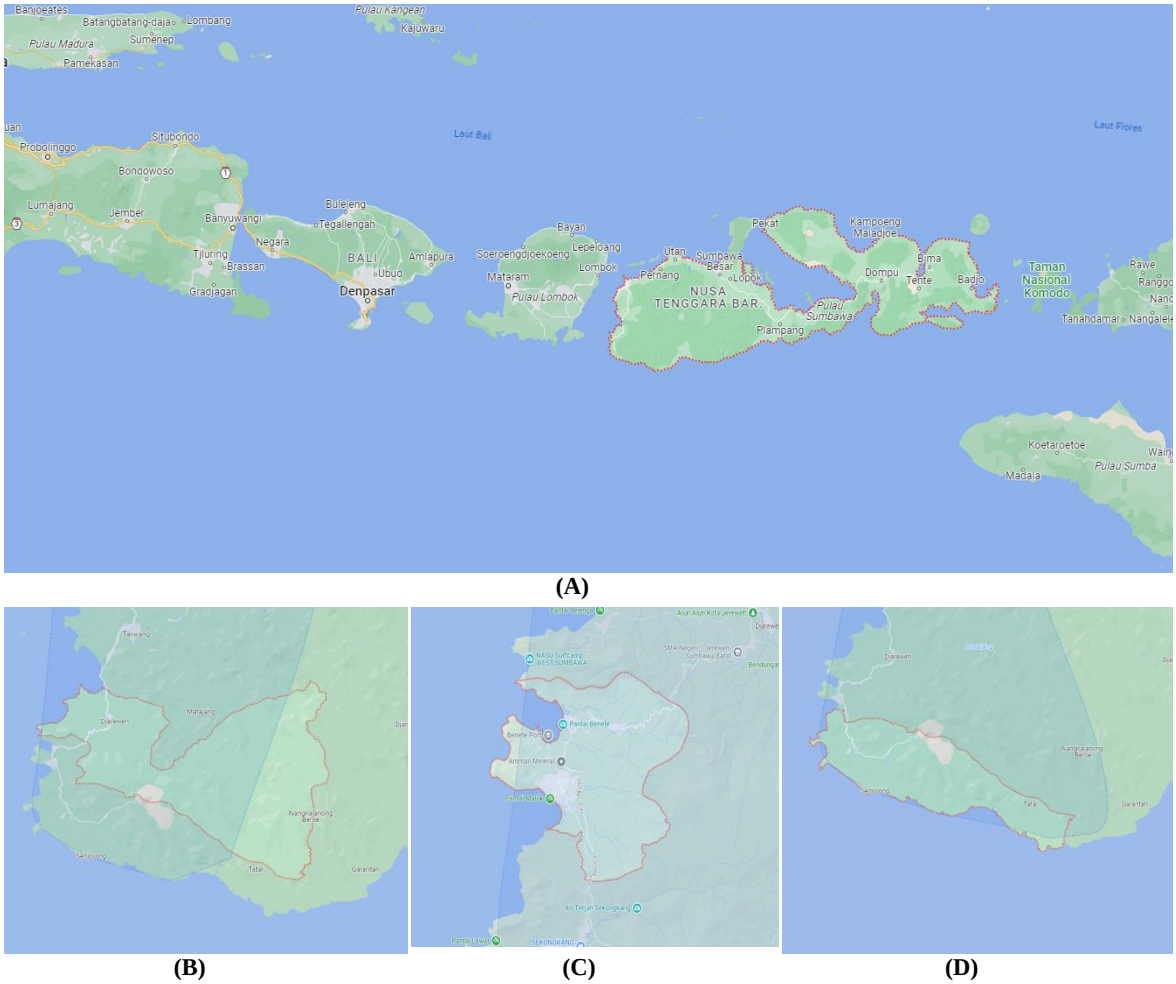

Fig. 1 – Maps of Sumbawa (A), Jereweh (B), Maluk (C), Sekongkang (D).

3. RESULTS AND DISCUSSION

Village Economic Development through Village-Owned Enterprises with the help of Internal and External Factors

Strategic factors that can be identified as *strengths*, *weaknesses*, *opportunities* and *threats* and are presented in Table 2. To get the ability of Internal and External strategic factors after the total IFAS *(Internal Factor Analysis Strategy)* and EFAS (*external factor analysis strategy)*, they will be presented in the form of an IE Matrix table. After getting the positioning of the BUMDes, and then the required development strategy, it is analysed again in the form of a SWOT Matrix, which gets four alternative strategy cells and prioritizes the strategy according to the positioning that has been obtained.

Based on the findings of the above data (Table 2), the internal and external strategic factors for village economic development through sustainable village-owned enterprises in the gold mining area of the West Sumbawa district are diverse, including the main strengths of BUMDes Management that already exist. The main strengths possessed by BUMDes Management already exist. However, it has a weakness, namely the lack of Human Resources management. So there needs to be support from the Regional Government to supervise the management of BUMDes businesses so that they are centralized and the businesses being fostered can also develop. Opportunities owned by local government support and threats to BUMDes business management are still weak.

Table 2

SWOT Diagram of Village Economic Development through BUMDes

IFAS / EFAS	**Strength**	**Weakness**
	1. BUMDes management is inplace 2. Overwrite businessresources 3. Enough humanresources 4. Business capitalfulfilled 5. Strategic businesslocation in the middle of the community 6. Source of Village Revenue partly fromBUMDes	1. BUMDes managers still lackexpertise 2. Business types arestill limited 3. Limited quality ofhuman resources 4. Limited capital in the COVID era 5. Infrastructure is still limited 6. Limited village innovation andBUMDes managers
	Opportunities	**Threats**
	1. Local Government Support 2. Village potential is relatively abundant 3. Community participation is good 4. Internet network support	1. BUMDes businessis still weak 2. Limited boardmotivation 3. Village expectations of theboard 4. Local culture

Source: Data Analysis, 2022.

The existence of administrative training in the savings and loan programme has a positive impact on business development. This is evidenced by the fact that the previously administrative process was still manual and has changed to using computerization as part of a regular system. Training can develop skills as the principal capital, especially in the MSME sector, which is seen as promising for profit. The potential of youth can be created by forming collaborative business groups so that family welfare and a more progressive future can be achieved. (I. Ibrahim, Mas'ad *et al.*, 2018; I. Ibrahim, Kamaluddin *et al.*, 2018).

Table 3

Internal Strategic Factor Matrix (*Internal Strategic Factor Analysis Summary*)

Strategic Factors	Weight	Rating	Score
Strength			
BUMDes management is in place	0.12	5	0.61
Overwrite business resources	0.08	4.5	0.37
Enough human resources	0.10	3.5	0.36
Business capital fulfilled	0.08	4	0.33
Strategic business location in the middle of the community	0.08	3	0.24
Source of Village Revenue partly from BUMDes	0.06	2.5	0.15
Weakness			
BUMDes managers still lack expertise	0.08	2.5	0.20
Business types are still limited	0.10	3.2	0.33

Limited quality of human resources	0.08	2.7	0.22
Limited capital in the Covid era	0.10	3.4	0.35
Infrastructure is still limited	0.06	3.8	0.23
Limited village innovation and BUMDes managers	0.04	2.9	0.12
Total	1	41	3.51

Internal factors in village economic development through sustainable village-owned enterprises in the West Sumbawa District gold mining area based on the weight matrix (Table 3) show that the total matrix IFAS score is 3.51. This condition shows in Table no. 3 that the strengths to overcome the internal weaknesses of BUMDes are strong so that it can support the BUMDes program in a more advanced manner.

BUMDes development needs support from the government through regulatory policies, capital facilitation and mentoring. Apart from that, there are several ways to carry out BUMDes development strategies, namely, in-depth observation and mapping of village economic potential, selecting profitable businesses, eradicating capitalist practices and expanding the network of business partners. Optimizing the role of financial partners, investors and the community to jointly encourage product improvement and diversification and strengthen the market. Keywords: Strategy, BUMDes, Village Economic Potential, Social Entrepreneur (Syarifudin & Astuti, 2020; Ardhana Putra *et al.*, 2019; Ibrahim *et al.*, 2016).

Table 4

External Strategic Factor Analysis Summary Matrix

Strategic Factors	Weight	Rating	Score
Opportunities			
Local Government Support	0.13	5	0.65
Village potential is quite abundant	0.13	4.5	0.60
Community participation is good	0.13	3.5	0.44
Internet network support	0.13	4	0.54
Threats			
BUMDes business is still weak	0.13	2.4	0.32
Limited board motivation	0.13	2.2	0.28
Village expectations of the board	0.12	2.1	0.24
Local culture	0.10	2	0.21
Total	1	25.7	3.27

The results of the identification of external strategies (Table 4) show that the matrix total of the EFAS score was 3.27. This condition indicates that village economic development through BUMDes in the West Sumbawa District gold mining area has opportunities to avoid existing threats. This is reinforced in Table no. 4, showing that external factors are substantial. Each cell (Table 3 and Table 4) has a range value of internal factors and external factors. The position and direction of management are selected by matching the total internal factor scores (IFAS matrix) and external factors (matrix EFAS) with the range of values in the cell.

The results showed that the opportunity to apply economics to BUMDes is very large. In addition, transaction contracts can be applied to BUMDes, and BUMDes development steps in capacity building efforts include: 1) structuring village institutions; 2) carrying out the BUMDes management in a professional, cooperative, independent and effective manner; 3) increasing the role, coordination and cooperation; and 4) understanding the needs of village communities for BUMDes. (Furqan & Fahmi, 2018; Ibrahim & Sutarna, 2018; Kusuma & Yohanitas, 2015).

Based on Figure 2, the weight value of the IFAS and EFAS matrices shows that the value of internal and external contributions is more favourable and has the opportunity to develop further.

SWOT analysis data IFAS scores reinforce this condition, while weights reach 3.51 and score and weight values reach 3.27; both are in a strong position. This position can be developed by selecting alternative strategies through the following SWOT results.

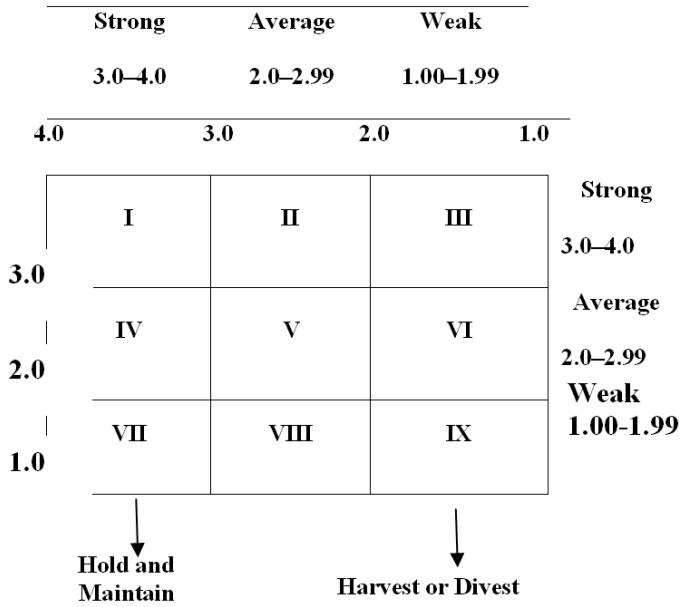

Fig. 2 – Internal and external matrix.

Village Economic Development Strategy through Village-Owned Enterprises

Various efforts have been made to develop the village economy, developing BUMDes into one of the flagship programs. However, due to the lack of human resources to creatively manage the institution, the program is only limited to the women's savings and loan business, becoming the central business unit favoured as a BUMDes activity. There are many alternative strategies to support BUMDes development and increase village and community income.

Table 5

Matrix Analysis

IFAS / EFAS	**Strength (S)** 1. BUMDes management already in place 2. Overwrite business resources 3. Enough human resources 4. Business capital fulfilled 5. Strategic business location in the community 6. Source of village revenue partly from BUMDes	**Weakness** 1. BUMDes managersstill lack experts 2. Business typesare still limited 3. Limited quality of human resources 4. Limited capital inthe COVID period 5. Infrastructure isstill limited 6. Limited villageinnovation and BUMDes management
Opportunities 1. Local governmentsupport 2. Village potential isabundant 3. Community participation is goodenough 4. Internet networksupport	**SO strategy** Training is needed to improve the skills of village officials and managers.	**WO Strategy** Improve cooperation with all parties in supporting th eBUMDes Program

Threats 1. BUMDes business is still weak 2. Limited board motivation 3. Village expectations of the management 4. Local culture	**ST Strategy** Implementation of entrepreneurship-based management skills	**WT Strategy** Need for innovation and creation of village parties and BUMDes administrators

The strategic factors based on the Table 5 matrix clearly illustrate the external opportunities and threats faced in accordance with the existing strengths and weaknesses. Therefore, it produces alternative solutions, including: Strategy 1 – training is needed to improve the skills of village officials and managers; Strategy 2 – the implementation of entrepreneurship-based management skills.

The acceleration of village economic development through BUMDes in a sustainable manner through these two strategies can provide opportunities and the possibility of evenly enhancing the village economy as a centre of economic growth. The BUMDes program can encourage the local authorities to increase the village's original income through the establishment of good governance. Changes in the orientation and role of BUMDes from village businesses for village governments to villagebusinesses for village people are achieved by synergizing BUMDes with village institutions so as to improve community welfare, especially in terms of local economic development, as well as by developing BUMDesa with a social entrepreneurial vision. (Nova & Arwanto, 2021; Fauzanafi & Hudayana, 2020; Setiawan *et al.*, 2021; Kania *et al.*, 2021).

4. CONCLUSIONS

Village economic development efforts through sustainable village-owned enterprises are needed to support the growth of village development. Village economic development through BUMDes can be carried out using alternative prioritized strategies, namely the need for training in improving the skills of village parties and managers (Strategy 1) and the application of entrepreneurship-based management skills (Strategy 2). In terms of community, it is expected that participation in the BUMDes program will increase. As to the local government, it is expected to continue to help BUMDes facilitate cooperation with business partners and provide guidance and supervision of BUMDes development in rural areas. Future researchers are expected to conduct the same research, primarily related to the training model in the Development Strategy of Village-Owned Enterprises (BUMDes).

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L'EXURBANISATION, UNE DÉMARCHE DE RÉGULATION ENVIRONNEMENTALE APPROPRIÉE A L'URBANISATION AUTOUR DU CHAMP GAZIER DE HASSI R'MEL EN ALGÉRIE

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Key-words: industrial cities, high-risk, proximity, exurban process, Hassi-R'mel.

Exurbanisation, an environmental regulation approach suitable for urbanization around the Hassi R'mel gas field in Algeria. Regarding the issue of the proximity between inhabited urban areas and high-risk industries, Algeria chose in 2005 to remove the dwellers and infrastructure around the gas field of Hassi-R'mel to the new town of Bellil. Since then, the process has still not been finalised, despite the large public investments. This research aims to analyse the SWOT factors of the exurban process. Focusing on the appropriateness of the site of Bellil and the urban development, these internal and external factors have enabled the identification of the issues which prolonged the process and hindered its success.

1. INTRODUCTION

Le développement des pôles industriels en Algérie a généré des richesses économiques très importantes, mais il a induit une urbanisation spontanée et accélérée autour d'industries à hauts risques. Ceci, pose une double problématique, d'une part, celle de la proximité entre milieu urbain habité et industries à hauts risques, et d'autre part, celle du processus d'urbanisation qui, en Algérie, par ses moyens d'élaboration et d'action, n'a pas pu agir sur les systèmes urbains de manière à préserver et développer des formes urbaines cohérentes (Hafiane, 2007).

Face à cette problématique complexe, qui se situe au creuset de l'économique, du social et de l'environnemental, la question est de savoir comment, dans des villes qui produisent en même temps des richesses et des risques (Peretti-Watel, 2000), peut-on maîtriser à la fois l'urbanisation et les risques, sachant que l'une des difficultés majeures est liée à l'imprévisibilité de ces derniers.

En réponse à cette question, plusieurs alternatives viennent cadrer la relation entre ville et industrie. Elles peuvent parfois mener à des mesures massives allant de la réduction de la densité, à la délocalisation, voire à l'exurbanisation des populations résidant à proximité des industries, afin d'assurer un éloignement suffisant pour réduire leur exposition, aux risques éventuels (Maillard, 2002). L'exurbanisation n'est, d'ailleurs, adoptée que si elle représente la seule alternative envisageable face à la gravité du risque et à la menace que peut engendrer sa proximité des établissements humains.

Dans cette optique, deux projets d'exurbanisation ont été entrepris en Algérie. L'un concerne la ville nouvelle de Hassi-Messaoud, et l'autre concerne la ville nouvelle de Bellil pour accueillir les populations résidant autour du champ gazier de Hassi-R'mel. Ces mesures, porteuses de directives urbaines et environnementales, représentent une spécificité nouvelle dans le contexte algérien. Le gouvernement a opté pour la séparation entre la ville et l'industrie par l'exurbanisation des populations résidantes, des services et des infrastructures, à l'extérieur du périmètre d'exploitation industrielle (PEI).

Cependant, nous constatons que jusqu'à nos jours, et depuis la décision de délocalisation en 1987, puis d'exurbanisation en 2005 de la ville de Hassi R'mel vers la ville de Bellil, selon la

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monographie élaborée en 2016 par la direction de la programmation et suivi budgétaire de la wilaya de Laghouat, la majeure partie soit plus de 72% de la population de la commune de Hassi R'mel demeure concentrée dans le PEI, et ce malgré les investissements publics conséquents, notamment pour le relogement massif dans la nouvelle ville. Les populations dont le nombre a augmenté de 34,68% entre 2008 et 2016 cohabitent toujours avec le champ gazier et sont exposées à de hauts risques majeurs. Paradoxalement, et bien qu'elle ait atteint un stade de développement relativement considérable, la ville nouvelle de Bellil enregistre un écart infrastructurel important comparativement à la ville de Hassi-R'mel qui a continué son développement, malgré les restrictions d'urbanisation. Cet état de fait nous conduit à questionner ce processus d'exurbanisation. Pour quelles raisons cette exurbanisation n'a-t-elle pas atteint les objectifs escomptés ? Est-ce dû à des dysfonctionnements dans le processus lui-même, ou plutôt à la gouvernance et aux modalités de sa mise en œuvre ?

2. CADRE THÉORIQUE ET MÉTHODE

Dans le champ de la recherche scientifique, plusieurs travaux ont traité de la thématique de la cohabitation ville/industrie dans des contextes géographiques et socioéconomiques multiples.

Beaucoup de ces recherches se sont intéressées à la maîtrise de l'urbanisation dans les zones à risques, dans sa dimension géographique (Pigeon, 2007; Chaline, Dubois-Maury, 2004; November, Penelas, et Viot, 2011; Dauphiné et Provitolo, 2013; Varaschin, 2007).

Certaines s'interrogent sur la possibilité d'envisager la cohabitation (Blésius, 2014) au sens de « *vivre ensemble* », ce qui conduit à s'intéresser particulièrement au risque en milieu urbain, c'est-à-dire à la mise en œuvre de mesures susceptibles de réduire les dangers inhérents à la présence d'industries dans la ville (Martinais, 1996). Ces mesures se traduisent par la mise en place de normes et de règles nouvelles d'urbanisation ou d'adaptation des instruments d'urbanisme, et la mobilisation de stratégies de gestion des risques. D'autres recherches mettent l'accent sur les dispositifs du relogement ou de la délocalisation des populations vers de nouveaux lieux de résidence pour des finalités plutôt environnementales, en particulier dans les régions caractérisées par les catastrophes naturelles.

Dans le contexte algérien, plusieurs travaux ont été menés, analysant de façon critique le processus de création des villes nouvelles et ses implications sur les plans urbain et socio-économique. (Salhi, 2005; Hadjiedj *et al.,* 2003; Côte, 2005; Sidi-Boumediene et Signoles, 2017 etc.).

Dans la ville de Hassi-R'mel, la cohabitation est une conséquence du développement de l'industrie gazière. Le noyau urbain étant essentiellement constitué de bases de vie et de logements d'astreinte abritait les ouvriers et cadres travaillant dans le complexe gazier. Cette ville a connu un développement urbain périphérique spontané au fil du temps. L'exode rural a largement participé à sa croissance et sa densification. Ainsi, le choix de la délocalisation puis de l'exurbanisation vient comme mesure d'éloignement de la ville et de l'industrie.

Sur le plan étymologique, le mot « délocalisation » vient du latin, du préfixe « de » qui signifie « cessation », et « locus », qui veut dire « lieux ». Bien que la délocalisation ait l'apparence d'une activité touchant le vécu urbain d'une agglomération à travers les infrastructures d'administration publique et services d'accompagnement, ses retombées sont en fait économiques, ce qui signifie transfert d'activités, de capitaux et d'emplois.

Au sens strict, la délocalisation concerne toutes les activités urbaines et revient à séparer les lieux de productions de ceux de la consommation. Elle est appelée dans d'autres ouvrages « exurbanisation ». On cite ici les ouvrages de sidi Mohamed Trache – « Exurbanisation et mobilités résidentielles à Nedroma », 2005 – ; Luca Pattaroni, Vincent Kaufmann, Adriana, « Habitat en devenir, enjeux territoriaux, politiques et sociaux du logement en suisse » 2009.

Rahim Aguejdad (2009) affirme – dans sa thèse intitulée « Etalement urbain et évaluation de son impact sur la biodiversité, de la reconstitution des trajectoires à la modélisation prospective. Application à une agglomération de taille moyenne: Rennes Métropole » – que « *la définition de la ville se recompose en*

permanence au rythme des territorialités toujours changeantes qui la constituent. Ceci s'accompagne d'une évolution des termes et des nomenclatures utilisés pour nommer les nouveaux territoires urbanisés (périurbains), banlieue, suburbanisation, rurbanisation, exurbanisation. Cette évolution du vocabulaire urbain et périurbain reflète parfaitement les changements et les mutations que subissent ces espaces ».

Le dictionnaire *Reverso* en ligne, le dictionnaire *Cordial* en ligne et L'encyclopédie universelle en ligne définissent l'exurbanisation comme étant le « *Fait d'habiter en périphérie d'une ville (souvent de façon forcée) »*.

Sur le plan historique, l'exurbanisation « *n'est pas véritablement nouveau, son importance était bien moindre par le passé. Ainsi, par exemple, au milieu du XIX^{ème} siècle, la population du faubourg de la Croix-Rousse, une périphérie lyonnaise alors en plein développement, n'était originaire qu'à 22% seulement de Lyon et à 66% de zones rurales* ».

Sur le plan économique, l'exurbanisation en Algérie s'expliques, selon Sidi Mohammed Trache 2005, par « *Deux stratégies de développement étaient mises en œuvre: la première – étatique – visait à la redynamisation de l'économie urbaine d'une ville qui a été pendant très longtemps oubliée, et ce par la création de nouveaux emplois tant industriels que tertiaires; ceux-ci rentraient dans le cadre des programmes de développement (PSW de Tlemcen en 1974 et plans nationaux) qui coïncident avec la promotion de la ville au rang administratif de chef-lieu de daïra; la seconde, à l'initiative de la commune, visait à répondre aux problèmes démographiques et en particulier à ceux liés à l'habitat par l'initiation, dans un premier temps, de programmes d'habitat collectif et semi-collectif, ensuite la mise en place des lotissements individuels et leur généralisation comme forme urbaine dominante dans l'urbanisation de la ville* ».

L'objectif premier de l'exurbanisation est de faciliter les agglomérations en tenant compte de la vocation principale et de faciliter, par conséquent, leur gestion.

Pour le cas des États Unis d'Amérique, selon Herbers (1986), « *La vie en périphérie offre également des possibilités de loisirs considérables. Comme l'économie moderne permet aux ménages des horaires ou des jours ou des lieux de plus en plus flexibles pour gagner leur vie, l'exurbanisation transformera la politique gouvernementale et la structure économique de la nation, et aura un impact irréversible sur tous les aspects de la vie américaine* » (Herers, 1986 dans Arthur C. Nelson, 1992).

Bernadette Mérenne-Schoumaker 1983 dans sa recherche intitulée « Exurbanisation ou réintégration urbaine des industries et du tertiaire lourd ? Comparaison et perspectives » a démontré que « *Comme l'exurbanisation, la réintégration urbaine regroupe deux types d'implantations: celles correspondant à la localisation de nouveaux établissements et celles qui résultent d'un mouvement de transfert ou d'extension de firmes préexistantes. Mais une différence majeure sépare les deux mouvements: pour l'exurbanisation on relève de nombreuses unités en provenance des espaces centraux, alors que dans le cas de la réintégration urbaine, il n'y a pratiquement aucune unité venant de la périphérie* ».

Nous envisageons dans cet article, à travers une analyse du processus d'exurbanisation, de vérifier d'une part, si le choix porté sur la ville nouvelle de Bellil était favorable aux plans social, économique et environnemental, et d'autre part, si le programme de développement urbain envisagé était suffisamment compétitif et attractif pour les populations concernées. La focale sera mise sur les mécanismes de mise en œuvre du projet d'exurbanisation et l'identification des principales contraintes qui ont pu entraver le bon déroulement du processus.

A cet effet, nous avons fait appel à l'analyse SWOT comme outil nous permettant de formuler une appréciation pré- et post-exurbanisation, sur la pertinence du projet et sa mise en œuvre. L'analyse du processus, sur les deux plans territorial et urbain, a porté en premier lieu sur la collecte et l'analyse des documents statistiques, instruments d'aménagement et d'urbanisme de l'échelle centrale à l'échelle locale, plan d'aménagement du territoire de wilaya (PATW), plan directeur d'aménagement et d'urbanisme (PDAU), plan d'occupation des sols (POS), des rapports d'étude de dangers et des instruments liés aux risques comme les plan général de prévention des risques majeurs (PGPRM) et les plan de prévention interne (PPI).

Dans un deuxième temps, nous avons procédé à l'analyse des contenus des questionnaires, élaborés sur un échantillon de 160 ménages avant délocalisation et 120 après délocalisation. Les ménages ont été choisis parmi les habitants des bidonvilles de Hassi R'mel qui ont été concernés en priorité par l'exurbanisation. L'analyse des contenus nous ont permis d'évaluer les changements opérés avant et après exurbanisation, en particulier en termes d'amélioration des conditions de vie des habitants, mais également en termes d'attractivité vers la ville de Bellil. Cette enquête a été complétée par des entretiens de type semi directif menés auprès de 22 acteurs institutionnels et élus, représentants du secteur industriel et des différentes administrations concernées par le processus.

Ce travail est articulé en quatre temps:

Dans la première section, nous présentons le contexte de Hassi-R'mel, depuis sa création et son développement d'un pôle industriel à une agglomération urbaine, ainsi que les circonstances dans lesquelles la décision d'exurbanisation a été prise.

Dans la deuxième section nous analysons la ville nouvelle de Bellil destinée à recevoir les infrastructures, les équipements urbains et les services d'accompagnement délocalisés de la ville industrielle de Hassi-R'mel, en mettant l'accent sur les principales raisons et les enjeux de sa création ainsi que le choix du site de son implantation.

La troisième section est consacrée à l'analyse par l'outil SWOT du projet d'exurbanisation en matière d'infrastructures et de services, mettant en exergue les différentes contraintes au bon fonctionnement du processus.

La quatrième section conclue et synthétise les aspects susceptibles d'être à l'origine de l'affaiblissement du projet.

3. LE CHAMP GAZIER DE HASSI R'MEL, CONTEXTE GÉOGRAPHIQUE ET ECONOMIQUE PARTICULIER FACE A SES RISQUES

3.1. Évolution de l'industrie et de la ville

En Algérie, les hydrocarbures sont le noyau de l'industrialisation (Andreff et Hayab, 1978). Ils ont représenté, selon le rapport de la Direction Générale du Trésor Public de l'année 2016 sur la période 2002–2015, en moyenne 98% des exportations du pays, 67% des recettes fiscales et ont contribué pour 35% du PIB.

Situé à 520 km au sud de la capitale Alger, le gisement de Hassi-R'mel découvert en 1956 (Aulard, 1991) s'étale sur plus de 3.500 km²: 70 km du nord au sud et 50 km d'Est en Ouest et dont les réserves atteignent 3.700 Gm^3 (milliards de m^3), à savoir 80% des réserves nationales (Combaz, 2002).

Selon Plan d'urbanisme directeur de la commune de Hassi R'mel, 1986, La création de l'agglomération de Hassi R'mel remonte à l'exploitation du premier puits de gaz. Avant le découpage administratif de 1984, Hassi R'mel jouissait du statut spécial appelé centre industriel saharien. « *Les premiers permis de recherche sont attribués en 1952 et 1953 à la S. N. REPAL, à la CFP (Algérie), à la CREPS 4 et à la CPA5. En 3 ans, jusqu'en 1956, ces quatre sociétés ont foré 137 kilomètres, terminé 102 forages (...)»* (Destanne de Bernis, 1971). Les premiers forages avaient permis de délimiter les niveaux géologiques et l'importance du réservoir à Gaz, et d'approfondir les connaissances sur son effluent. Depuis la découverte de son champ gazier, cette région originellement pastorale connaîtra une grande évolution de l'activité industrielle.

En 1961, on assiste à la réalisation d'une petite unité de traitement de gaz de 1.3 milliards de m^3 par an. Cette réalisation a coïncidé avec la construction de la première usine de liquéfaction de gaz en 1964. En 1969, la capacité du champ gazier de Hassi-R'mel est portée à 4 milliards de m^3 par an. Elle atteindra 14 milliards de m^3 par an, après la nationalisation des hydrocarbures en 1971. La période post-nationalisation a permis de concrétiser un plan de développement, qui concerne l'ensemble du champ, visant à répondre aux besoins énergétiques du pays.

Grâce à ce plan de développement, Hassi-R'mel s'est vue dotée d'un modèle d'exploitation en mesure d'optimiser la récupération de différents produits, jusqu'à atteindre une capacité de production de 94 milliards de m^3 par an.

D'un petit embryon qui abritait les ouvriers des usines, cette ville est devenue un véritable pôle industriel et un bassin propice à l'emploi.

Située sur la route nationale N°1 (Fig. 1) entre les wilayas de Ghardaïa et de Laghouat, elle devient, après 1984, chef-lieu de commune et sera annexée à la wilaya de Laghouat.

D'après la monographie élaborée en 2016 par la direction de la programmation et suivi budgétaire de la wilaya de Laghouat, commune de Hassi R'mel occupe une superficie de 2.841 Km² et abrite une population estimée, à la fin de l'année 2016, à 30.139 habitants.

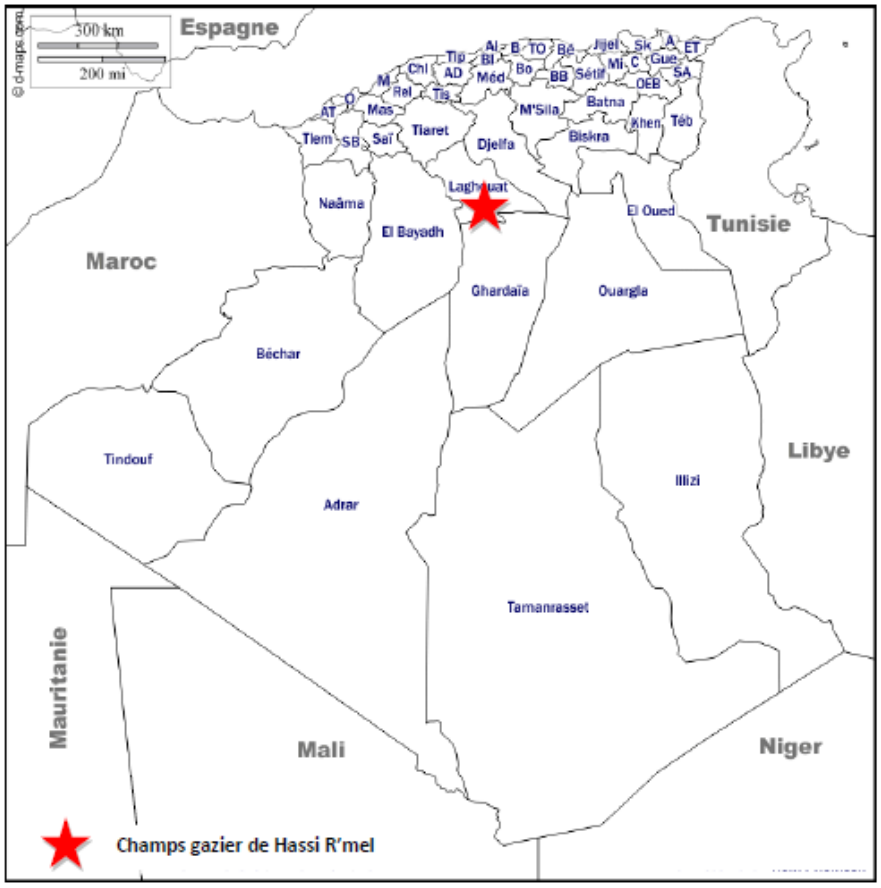

Fig. 1 – Situation géographique de la ville industrielle de Hassi R'mel.
Source: adaptée par les auteurs à partir de https://d-maps.com/carte.php?num_car=4429&lang=fr.

3.2. Une délocalisation freinée

Hassi R'mel, à l'instar des villes industrielles en Algérie, connaît un attrait important des populations à la recherche d'emploi. Cette particularité mène inévitablement à la prédominance d'une urbanisation démographique et la montée de la précarité urbaine (Hadjiedj, Chaline et Dubois-Maury, 2003), qui ne sont dans tous les cas ni maîtrisées, ni contrôlées, ni même planifiées. L'exode rural a largement participé au déséquilibre urbain de ces villes, car les besoins engendrés par la croissance démographique face à une offre d'emploi insuffisante, notamment en milieu rural, n'ont pas permis

d'absorber toute la main d'œuvre disponible (Bédrani, 1998). À Hassi R'mel, ceci est particulièrement identifiable entre 1988 et 2000.

La multiplication des acteurs et l'enchevêtrement de leurs prérogatives se reflètent également sur le développement urbain incohérent de Hassi R'mel. En effet, l'urbain est régi par la réglementation urbaine de la commune et sous la tutelle du ministère de l'intérieur, alors que les usines composant le territoire industriel des sociétés d'hydrocarbures, qui sont de gestion autonome (mais avec une planification centralisée), sont mises sous la tutelle du ministère de l'énergie.

Cette urbanisation non maîtrisée conduit inévitablement à l'augmentation du niveau d'exposition des populations résidantes, aux risques éventuels du fait de la proximité de l'habitat (en l'occurrence précaire) et de l'industrie (Fig. 2).

Afin de remédier cette situation, il a été décidé, dans le cadre de l'arrêté du 14 novembre 1987, de transférer le siège du chef-lieu de la commune de Hassi R'mel vers le lieu-dit « Bellil », afin d'accueillir les travailleurs, les infrastructures administratives et sanitaires et de reloger les habitants des bidonvilles. L'objectif – selon le procès-verbal de la réunion de la wilaya de Laghouat, le 29 mai 1989, avec pour ordre du jour la ville nouvelle de Bellil – est de permettre le développement du chef-lieu sans contraintes et de garantir « *la sécurité aussi bien des installations que des populations vivant à l'intérieur du périmètre de danger* ».

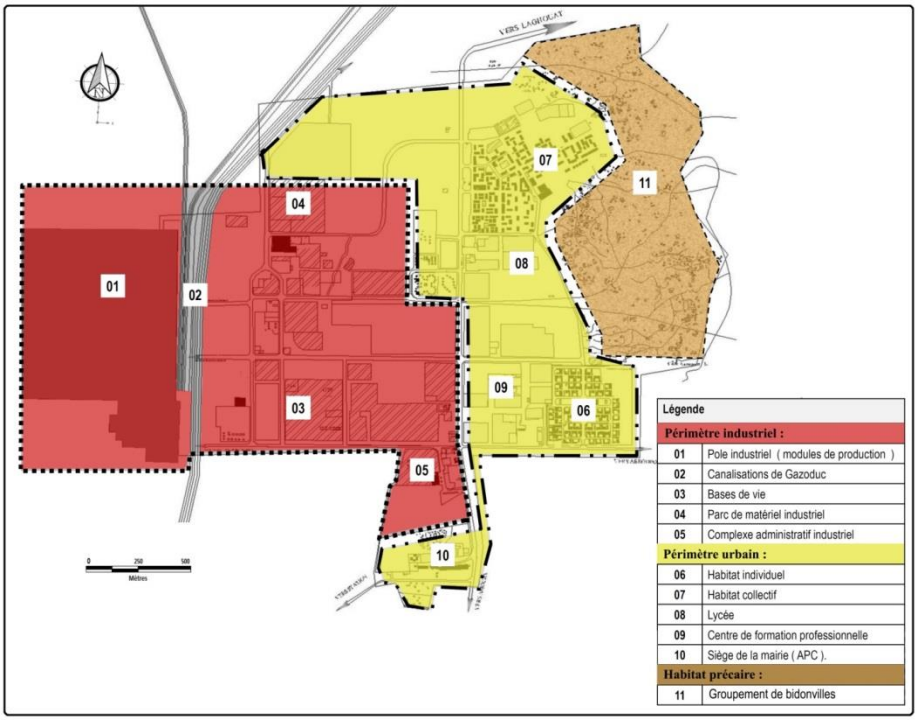

Fig. 2 – Plan d'identification des entités industrielle et urbaine de la ville de Hassi R'mel
Source: élaborée par les auteurs.

Bellil se trouvant en bordure du premier axe routier Nord-Sud du pays, prolongé par la route transsaharienne reliant les ports méditerranéens du pays au sud du Sahara, puis à proximité du complexe industriel de Hassi R'mel et au carrefour des zones steppiques, devait constituer un pôle urbain stratégique qui contribuerait à l'équilibre spatial et économique de la région. De plus, Hassi R'mel étant le deuxième poumon du secteur économique de l'Algérie après le champ pétrolier de Hassi Messaoud, il était nécessaire de lui accorder une attention particulière afin d'assurer son niveau de compétitivité mondiale.

Cependant, le développement de la nouvelle ville de Bellil a connu un rythme très lent, malgré l'état d'avancement des travaux dont attestent les documents administratifs et Procès-verbaux de la wilaya de Laghouat. Parallèlement, et paradoxalement, la ville de Hassi R'mel a continué son développement et croissance urbaine à l'intérieur du PEI du champ gazier. Ceci s'explique par la situation de crise économique, qui a affecté l'Algérie après 1986 avec la chute des prix des hydrocarbures et puis bientôt une crise politique qui n'a pas permis, et ce durant toute la décennie 90, d'asseoir le processus de transfert et d'atteindre les objectifs escomptés. L'insécurité généralisée de tout le pays durant la décennie noire a paralysé tous les projets planifiés. Ce n'est qu'à partir de l'année 2000, et avec la relance économique, que la situation connaîtra un nouveau souffle.

4. L'EXURBANISATION, NOUVELLE STRATÉGIE DE MAITRISE DES RISQUES INDUSTRIELS MAJEURS

4.1. Nouvelle conscience environnementale

L'injonction de l'impératif environnemental dès l'année 2000 à l'échelle mondiale et l'avènement des nouvelles tendances du développement durable, a permis un recadrage des risques en particulier par rapport au voisinage ville/industrie. Un ensemble de dispositifs règlementaires servant d'outils d'accompagnement s'avère indispensable, notamment en Algérie. L'exurbanisation de Hassi R'mel s'explique donc par l'obligation pour l'Algérie de se conformer aux accords et conventions ratifiés au niveau international dans le domaine de l'environnement et de développer son arsenal juridique en matière de maîtrise d'urbanisation et de gestion des risques. Ceci coïncide également – selon le dossier complet de la catastrophe publié dans la revue Bimensuel de l'économie et de la finance L'éco n°66 / du 16 au 30 mai 2013– avec l'explosion survenue en 2004 dans le complexe du Gaz Naturel Liquéfié de Skikda à l'Est Algérien, qui a donné une nouvelle conscience par rapport à la prévention des risques.

Dans ce cadre, la loi 04–20 du 25 décembre 2004, relative à la prévention des risques majeurs et à la gestion des catastrophes dans le cadre d'un développement durable, vient concrétiser cette nouvelle volonté politique. C'est ainsi que Hassi-R'mel est déclaré zone à risques majeurs par le décret exécutif n° 05–476 du 20 décembre 2005.

Dans ses articles 3, 4, 5 et 10, le décret 05–476 apporte plus de précisions quant à la manière avec laquelle on doit prévoir et gérer les risques majeurs. Il est prévu, dans son article 5, que « *les activités secondaires et tertiaires, ainsi que les logements et les infrastructures non liés aux activités des hydrocarbures, implantés actuellement à l'intérieur du périmètre d'exploitation du gisement de Hassi-R'mel, seront transférés hors de ce périmètre. Les bidonvilles, constructions illicites et habitations précaires érigées à l'intérieur du périmètre d'exploitation du gisement de Hassi-R'mel seront démolis* ».

Ce décret vient donc renforcer le dispositif de 1987 et insister sur la séparation entre le complexe industriel et les entités urbaines, stipulant clairement l'exurbanisation complète et définitive vers la ville nouvelle de Bellil. Ce projet vient également en réponse à un souci environnemental exprimé par les instruments législatifs et techniques d'aménagement du territoire qui stipulent: « *Les Villes Nouvelles d'appui au développement durable […] sont créées afin de répondre à des problèmes écologiques ou à des risques industriels* » (Schéma National d'Aménagement du Territoire Échéancier 2025, p. 9). Les objectifs visés par l'exurbanisation s'inscrivent, dès lors, dans des impératifs de durabilité et visent la réalisation de programmes ambitieux.

4.2. Exurbanisation ou croissance urbaine bipolaire ?

Dans la ville de Hassi-R'mel, à l'exception de quelques notions de servitudes classiques régissant l'urbanisation à proximité des conduites de gazoduc et d'oléoduc, le processus de développement urbain régit par un plan d'urbanisme directeur (PDU) dès 1986 était d'une cadence

similaire à toutes les communes de la wilaya de Laghouat. Suite à l'instauration de la loi 90–29 du 1er décembre 1990 relative à l'aménagement et l'urbanisme, Hassi-R'mel sera dotée en 1995 d'un Plan Directeur d'Aménagement et d'Urbanisme (PDAU). Cependant, entre 1995 et 2005, la ville de Hassi-R'mel a continué sa croissance et son développement urbain de manière bipolaire, sans aucune spécification particulière par rapport à la zone à risque.

En 2005, Hassi R'mel a été déclarée zone à risques majeurs exigeant l'exurbanisation, par expropriation des biens immobiliers pour cause d'utilité publique. De ce fait, tous les programmes de développement et d'habitat, inscrits au profit de cette ville, ont été orientés vers la ville nouvelle de Bellil, introduisant une nouvelle vision axée sur les risques. C'est ainsi qu'un PEI sera défini pour s'étendre sur une superficie totale de 4.804 km^2. Celui-ci, comme le montre la Figure 3, fait apparaître que la ville de Bellil se trouvait dans le PEI. Cette découverte a généré une situation de gel des instruments d'urbanisme entre 2005 et 2008, et toute construction à l'intérieur de ce périmètre fut interdite.

Pour débloquer le processus d'urbanisation de Bellil, le décret 08–241 du 3 Août 2008 vient exclure Bellil du périmètre à risques. Cette dernière va occuper la zone d'exclusion portant une surface de 15,9 km². Son aire d'urbanisation est alors définie par le PATW. Cette nouvelle situation a permis de séparer géographiquement le territoire du risque du territoire de sécurité et de clarifier les prérogatives en matière de gestion urbaine. Cette nouvelle situation a nécessité la révision du PDAU de 1995.

Dans sa nouvelle version, le PDAU révisé et finalisé en 2009 réintroduit, d'une part, la particularité de la zone de Hassi-R'mel comme zone à hauts risques majeurs, et insiste, d'autre part, sur l'urgence de l'exurbanisation vers la ville de Bellil. Dans le rapport final du PDAU, Hassi R'mel est alors considérée comme « site fermé » à l'urbanisation, et les programmes de développement prescrits dans son périmètre urbain devaient être orientés vers la ville nouvelle de Bellil. En soutien à cette décision, un programme de développement urbain a été établi dont les objectifs étaient de faciliter l'accueil des ménages relogés et veiller à leur stabilisation. Ce programme (Fig. 4) est composé de logements, d'équipements publics et d'aides à l'auto-construction.

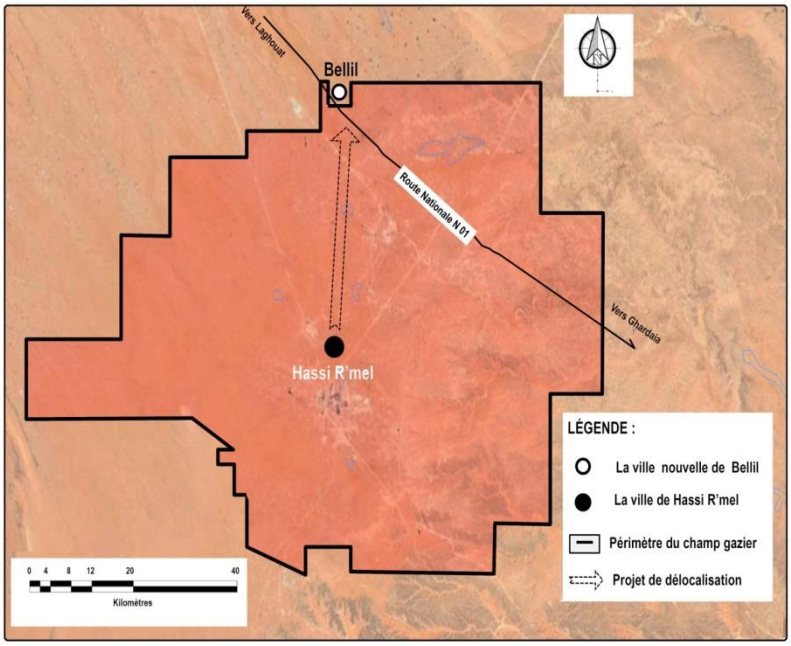

Fig. 3 – Plan de situation de la ville nouvelle de Bellil par rapport au périmètre d'exploitation selon les décrets 05–476, 08–241.
Source: élaboré par les auteurs.

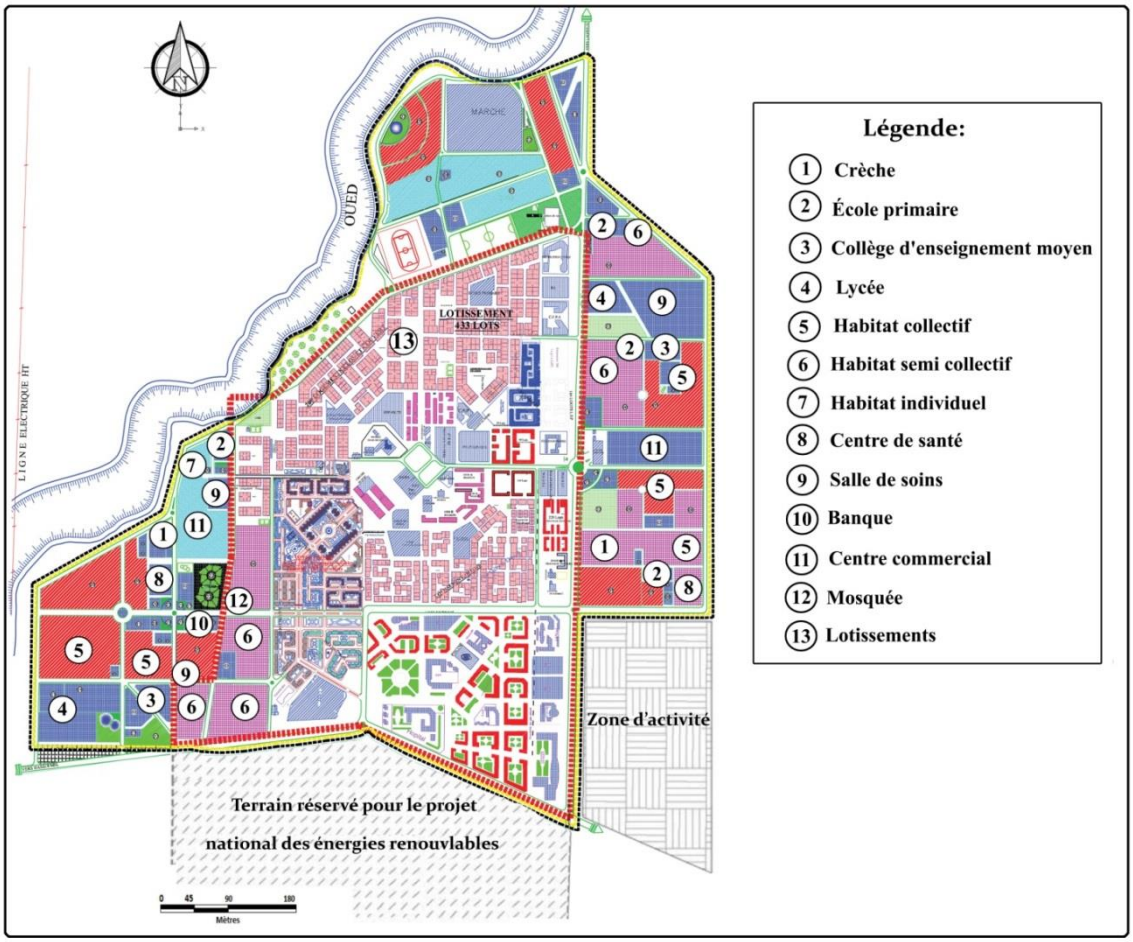

Fig. 4 – Plan d'aménagement de la ville nouvelle de Bellil.
Source: Agence Régionale d'Urbanisme de Laghouat.

Une fois relancé, le processus d'exurbanisation sera programmé en plusieurs phases. Dans ce cadre, un projet de 1.200 logements sociaux locatifs a été destiné à la population délocalisée. Ces phases de délocalisation entre 2010 et 2014 ont touché une partie des ménages issues essentiellement de l'exode rural; soit environ 4.000 habitants selon l'office de la promotion et de la gestion immobilière (OPGI) de la wilaya de Laghouat.

Parallèlement à cela et d'après les statistiques extraites du rapport de Plan Directeur d'Aménagement et d'Urbanisme de la commune de Hassi R'mel 2009 et celles de la monographie de la wilaya de Laghouat, 2016, on constate qu'au moment du processus d'exurbanisation, la population de la ville de Hassi R'mel est passée de 16.184 en 2008 à 21.796 en 2016 soit une augmentation de 34.68 %, alors que la ville nouvelle de Bellil avoisine les 7.000 habitants seulement à la fin de 2016.

Il faut remarquer que le relogement des populations dans la ville de Bellil dépend de l'état d'avancement des chantiers de constructions.

Par ailleurs et d'après nos enquêtes réalisées dans le cadre de l'évaluation quantitative du projet d'exurbanisation, nous constatons qu'en plus de la croissance démographique et de l'attractivité de l'emploi, les populations résidantes restent attachées à leurs quartiers d'origine malgré la présence du risque industriel. D'autre part, le rythme de réalisation des équipements dans la ville de Bellil reste très faible comparativement à ceux qui existent à Hassi R'mel.

5. ÉVALUATION QUANTITATIVE DES IMPLICATIONS DU PROJET D'EXURBANISATION

À travers une grille (axe-enjeu / préoccupation / acteur) la structure de base pour les enquêtes effectuées *in situ* par questionnaires ou par entretien selon les différents enjeux et les acteurs de l'action urbaine selon leur domaine d'intervention à savoir les élus, les administratifs, les industriels, les techniciens, les organisations de la société civile et les citoyens et un ensemble d'indicateurs, l'évaluation portant un aspect comparatif des deux situations vécues par la population (pré-exurbanisation et post-exurbanisation) a permis de mettre en exergue plusieurs éléments d'amélioration apportées par ce projet et d'autres aspects d'inadéquation et de faiblesses de ces nouveaux lieux de résidence (Fig. 5).

Enjeu	Indicateur	Situation pré-exurbanisation (ville de Hassi R'mel)	Valeur (10 pts)	Situation post-exurbanisation (ville de Bellil)	Valeur (10 pts)
Habitat	Nombre de logements	3.225 logements 1.200 bidonvilles	5	2.222 logements	7
	Densité par logement (T.O.L)	6,3 personnes / Logement	7	6,7 personnes / Logement	6
	Adéquation au contexte social	Moyenne	5	Faible	3
Equipements et les services d'accompagnement	Socioculturels	28 équipements	8	6 équipements	1,50
	Culturels	8 équipements	8	3 équipements	2,63
	Administratifs	24 équipements	8	10 équipements	3,33
	Sanitaires	12 équipements	8	5 équipements	3,33
	Infrastructures de mobilité	00 équipements	0	00 équipements	0,00
Voirie et réseaux divers	A.E.P.	60 %	6	80 %	8
	Assainissement	50 %	5	80 %	8
	Électricité	60 %	6	80 %	8
	Gaz	60 %	6	80 %	8
	Connexion aux réseaux internet	60 %	6	50 %	5
	Collecte de déchets	50 %	5	80 %	8
Moyens de mobilité	Déplacement à pied	47,50%	7	5,00%	5
	Moyens de service	41,25%		56,67%	
	Moyens informels	3,75%		–	
	Moyens personnels	7,50%		6,67%	
	Transport privé	–		31,67%	
Impact social	Attachement aux lieux.	Fort	7	Moyen	5
	Stabilité résidentielle	Moyenne		Faible	
Impact économique	Emploi	Taux d'occupation élevé	9	Baisse de possibilités d'emploi dû à l'éloignement	5
	Commerce	Activité commerciale riche et diversifiée	7	Absence d'espaces commerciaux et prolifération du commerce informel	2

(continua)

Protection contre les risques industriels	Risque de l'industrie gazière	Ville située à côté de l'industrie gazière	2	Ville enclavée et dans le périmètre d'exploitation et des risques du champ gazier	5
	Risque de pollution atmosphérique	Plus de 330 tonnes de CO2 émises par les usines de Hassi R'mel (. SAAD, Sawsen HAMZI Rachida 2012)	2	Ville relativement protégée	7
	Risque de pollution du sol et des nappes	Prolifération des bourbiers (Ould Khettab Djamila 2015)	2	Présence de la station d'askarel au nord de la ville	4

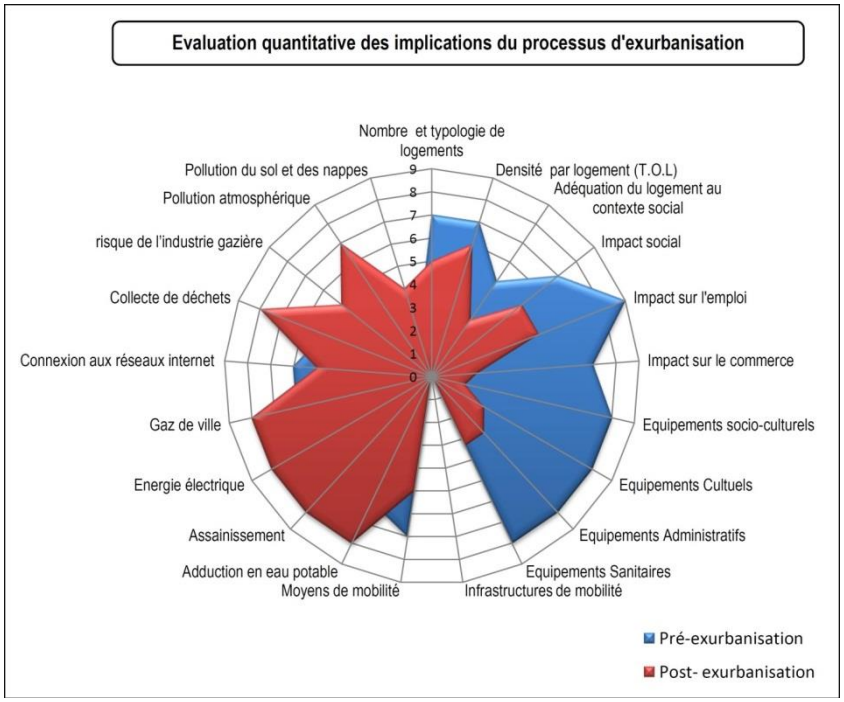

Fig. 5 – Evaluation quantitative des implications du projet d'exurbanisation.
Source: élaboré par les auteurs.

6. L'EXURBANISATION, ENTRE OBJECTIFS ET REALITÉS

Dans cette section nous présenterons les résultats de notre analyse SWOT. L'analyse des documents et des contenus des entretiens nous ont permis de construire 56 facteurs, que nous avons codés et classés en facteurs endogènes (forces, faiblesses) et exogènes (opportunités, menaces) sur la double échelle (territoriale et urbaine).

Ces facteurs ont été classés par thématique selon deux registres: cadre de gouvernance et développement urbain. Ainsi, nous avons identifié 21 facteurs portant sur la gouvernance et 37 portant sur le développement urbain.

Après la construction de la matrice, nous avons procédé au croisement des différents facteurs, d'abord linéairement et puis transversalement (facteurs endogènes: atouts, faiblesses; facteurs exogènes: opportunités, menaces; puis facteurs endogènes-facteurs exogènes).

6.1. Cadre de gouvernance

		Positifs	Négatifs
Cadre juridique et Instrumental	**Facteurs endogènes**	**Strenghts (Atouts)** **S1**. Décision d'exurbanisation portée par le décret 05–476 et de délocalisation des différentes infrastructures administratives vers le lieu-dit Bellil. **S2**. La translation des programmes de développement destinés à Hassi R'mel sur la ville de Bellil. **S3**. La mise en œuvre de programmes ambitieux et de financements conséquents pour la réalisation du projet. **S4**. La révision du PDAU et l'existence d'instruments de planification, d'aménagement et d'occupation du sol. **S5**. Déclaration et délimitation du périmètre de sécurité.	**Weaknesses (Faiblesses)** **W1**. Bellil n'a pas un statut de ville nouvelle, mais d'agglomération secondaire et est, de ce fait, prise en considération par les instruments d'aménagement du territoire de façon limitée. **W2**. Absence d'un organisme spécifique chargé de la gestion du processus d'exurbanisation. **W3**. L'exurbanisation n'est pas considérée comme un processus de planification à part. **W4**. Lenteurs bureaucratiques et administratives dans la délocalisation des structures administratives et absence d'échéancier d'achèvement des travaux. **W5**. La procédure d'expropriation ordonnée par le décret 05–476 n'est pas mise à exécution.
	Facteurs exogènes	**Opportunities (Opportunités)** **O1**. Programme de relance économique. **O2**. Présence d'un arsenal juridique et législatif motivant en faveur d'un développement urbain préservant l'environnement. **O3**. L'existence d'une volonté d'asseoir une stratégie environnementale à travers les SNAT, SRAT et PAWT.	**Threats (Menaces)**
Acteurs publics	**Facteurs endogènes**	**Strenghts (Atouts)** **S6**. Séparation dans la gestion de la ville entre les secteurs industriel et urbain.	Weaknesses (Faiblesses) W6. Présence partielle des services déconcentrés des collectivités locales et des directions exécutives dans la ville de Bellil. W7. Insuffisance de l'activité associative et absence de l'implication citoyenne (une seule association active en environnement). W8. Incompétence des techniciens en matière de gestion des risques.
	Facteurs Exogènes	**Opportunities (Opportunités)** **O4**. L'existence d'un centre national d'aide à la décision auprès du ministère de l'intérieur **O5**. Délégation nationale aux risques majeurs (décret 11–194). **O6**. Contribution du service industriel de l'environnement à la sensibilisation aux risques.	**Threats (Menaces)** **T1**. Opposition d'ordre tribale.

6.2. Développement urbain

		Positifs	Négatifs
Planification urbaine	**Facteurs endogènes**	**Strenghts (Atouts)** **S7**. L'emplacement de Bellil au carrefour des réseaux routiers (national et transsaharien) reliant les ports algériens au grand sud. Le passage de la route nationale N°1 reliant la capitale au grand sud longeant le tissu urbain et motivant une poussée économique urbaine significative. **S8**. Préexistence d'un noyau urbain motivant le développement et l'orientation des nouveaux programmes de la commune vers la ville nouvelle conformément au décret 05–476. **S9**. Proximité et connexion au réseau d'agglomérations limitrophes (Hassi Delaa, zone pastorale; Hassi R'mel, pôle industriel) avec des lignes de transport en commun intercommunal. **S10**. La ville est dotée de différents réseaux. **S11.** Le foncier, appartenant au domaine public, ne présente aucune contrainte pour le développement urbain.	**Weaknesses (Faiblesses)** **W9**. Insuffisance d'équipements de proximité et de service en matière de santé, sécurité, commerce etc. **W10**. Surface de logement non appropriée à la particularité socio-économique locale (le Taux d'Occupation par Logement après exurbanisation dépasse les 7; ceci est dû à la surface standard du logement non adaptée aux particularités sociales des ménages concernés, la taille de ces ménages représente 48,34 % de moins de 5 personnes, 19,17 % de 5 à 8 personnes, 24,16 % de 8 à 10 personnes, 8,33 % de plus de 10 personnes). **W11**. Inadéquation entre l'offre et la demande en logement, après exurbanisation, Selon la Daïra (sous-préfecture) de Hassi R'mel, le programme de logement inscrit au profit de la commune entre 2010 et 2018 est de 750 logements, sur une demande dépassant les 8.000 demandes de logement en fin avril 2018). **W12**. La ville ne peut se développer que sur un seul côté (entourée du périmètre d'exploitation sur trois côtés). **W13**. Existence d'un seul puits d'alimentation en eau potable. **W14**. Absence de coordination entre les acteurs industriels et les acteurs de la gestion urbaine. **W15**. Absence de réseau de transport en commun interne à Bellil.
	Facteurs exogènes	**Opportunities (Opportunités)** **O7**. Existence de différentes formules d'accès et d'aide financière au logement assuré par l'état. **O8**. Présence d'équipements scolaires et d'antennes administratives (état civil, écoles, poste et protection civile) proches des cités résidentielles.	**Threats (Menaces)** **T2**. Localisation par rapport au périmètre des risques industriels du champ gazier (exclusion par acte graphique). **T3**. Risque de hausse des besoins en réserves foncières pour l'achèvement de l'exurbanisation et la saturation de la ville du fait d'un périmètre d'urbanisation limité.

		Positifs	Négatifs
Socio Économique	**Facteurs endogènes**	**Strenghts (Atouts)** **S12**. Population jeune de moins de 35 ans, estimée à 75% en 2017. Donc, d'une frange active importante de la population. **S13**. Amélioration des conditions de vie (logements plus confortables et décents – présence des commodités: électricité, gaz et eau) **S14**. Rente économique importante qualifiant la ville parmi les communes les plus riches d'Algérie.	**Weaknesses (Faiblesses)** **W16**. Population peu qualifiée, issue de l'exode rural. **W17**. Inadéquation de la taille et des formes de logement au regard de la taille des ménages et du mode de vie traditionnel dominent. **W18**. Faiblesse de l'offre d'emploi économique hors secteur industriel et prolifération du commerce informel.
	Facteurs exogènes	**Opportunities (Opportunités)** **O9**. Programme de soutien à l'investissement par l'Agence Nationale de l'Emploi de Jeunes (développement des petites et moyennes entreprises). **O10**. Existence d'une activité pastorale. **O11**. Programme nationale de développement local et dispositifs d'investissement local (loi de finance, 2015). **O12**. Fond commun des collectivités locales (Décret 14–116 du 24 mars 2014).	**Threats (Menaces)** **T4**. Vulnérabilité économique des ménages et hausse du chômage. **T5**. Ville dortoir.

(continua)

Environnemental	**Facteurs endogènes**	**Strenghts (Atouts)** **S15**. Eloignement de la population délocalisée des risques éventuels du champ gazier. **S16**. Recyclage des déchets.	**Weaknesses (Faiblesses)** **W19**. Manque de cadre de sensibilisation et d'information sur les risques. **W20**. Absence de normes et de référentiels en matière de gestion des risques dans la planification urbaine.
	Facteurs exogènes	**Opportunities (Opportunités)** **O13**. Présence d'un service d'hygiène, de sécurité et d'environnement au niveau du pôle industriel de Hassi R'mel aidant à la prise de décision en zones urbaines à risques. **O14**. Usage des énergies renouvelables pour l'éclairage public au niveau des communes. **O15**. Existence d'un plan général de prévention des risques pour la ville de Hassi R'mel	**Threats (Menaces)** **T6**. Risque de contamination des sols et de la nappe phréatique. **T7**. Risque de stress hydrique.

7. DISCUSSION DES RÉSULTATS

Le croisement des facteurs positifs et négatifs, puis endogènes et exogènes, nous a permis d'obtenir les résultats suivants:

7.1. Au niveau de la gouvernance du projet

Les accidents qu'a connus l'Algérie en général et l'accident du complexe gazier de Skikda en particulier ont été un tournant en matière de renforcement du cadre juridique dans le domaine de l'environnement, en particulier depuis 2004. Ainsi, la relance économique qu'a connue l'Algérie dès l'année 2000 aussi que l'existence de différents instruments d'aménagements et schémas territoriaux viennent consolider la stratégie d'exurbanisation et de création de la ville nouvelle de Bellil, portée par le décret 05–476. Cette décision est accompagnée d'actions fortes, notamment à travers la translation des programmes de développement destinés à Hassi-R'mel sur la ville de Bellil. Cependant, ces actions n'ont pas été suivies de mesures claires et concrètes du point de vue de la mise en œuvre du processus. Bellil, et bien qu'elle soit une agglomération nouvellement créée (1987), ne jouit pas du statut de ville nouvelle comme dans le cas de Hassi-Messaoud créée par décret exécutif N° 06–321, et le décret exécutif N° 06–322 du 18 septembre 2006, fixant les missions, l'organisation et les modalités de fonctionnement de l'organisme de la ville nouvelle de Hassi-Messaoud (voir le journal officiel N°58 du 20 septembre 2006). La ville de Bellil est par contre considérée dans le PDAU comme une agglomération secondaire et la seule particularité dictée par le POS est que Hassi R'mel est considéré comme site fermé à l'urbanisation. La réglementation n'accorde en aucun cas une spécificité ou met en valeur l'exurbanisation comme un processus de planification stratégique globale à part et ne prévoit ni date limite pour l'achèvement du projet, ni les couvertures financières nécessaires.

La décision d'exurbanisation des infrastructures et des populations habitant à l'intérieur du périmètre d'exploitation a permis de territorialiser les modes de gestion industrielle et urbaine. En effet, la gestion du processus est confiée aux services techniques des organes déconcentrés de la wilaya, telles que les différentes directions (du logement, de l'environnement, des équipements etc.). Cependant, l'absence d'un cadre juridique et réglementaire définissant les prérogatives et les missions des différents acteurs concernés, accentue les lenteurs administratives et crée des incohérences dans la mise en œuvre des actions prescrites dans les instruments d'urbanisme. Ceci s'explique entre autres

par le manque de qualification en matière de normes de gestion urbaine des risques d'une part, et l'absence de coordination avec les instances chargées de la protection de l'environnement au niveau du complexe gazier, d'autre part. Pourtant, une telle coopération pourrait contribuer au moins à la sensibilisation des populations aux risques.

7.2. Au niveau du développement urbain

7.2.1. La planification urbaine

Bellil se situe au carrefour des routes reliant les ports du nord au grand Sahara. Cette position centrale permet une bonne connexion et une accessibilité facile. De plus, l'existence d'un noyau résidentiel datant des années 80, de réseaux d'énergie (électricité et gaz naturel) et des différents POS (après la révision du PDAU) dessinant l'occupation des sols ont favorisé le choix de développement de Bellil.

L'importance des programmes consacrés au développement urbain, en matière d'équipements et de logements inscrits à l'échelle de la wilaya, ainsi que les programmes compilés à l'échelle communale, après la décision de transfert des infrastructures du chef-lieu de Hassi-R'mel et les moyens de transport et de déplacement assurés par les groupes industriels, consolident le processus de développement urbain.

La construction d'un important programme de logement à Bellil entre 2008 et 2017, dont le parc est passé de 314 logements en 1998 selon le rapport du PDAU 2009 à 3.323 en 2017 selon la monographie de la wilaya de Laghouat, 2017, en comparaison avec la ville de Hassi R'mel qui n'a connu la réalisation d'aucun projet, représente une avancée significative pour freiner l'urbanisation de Hassi R'mel et accélérer le développement de Bellil.

Cependant, les enquêtes montrent que 74% des ménages délocalisés sont partiellement satisfaits des services offerts dans la nouvelle ville. En effet le transfert des infrastructures administratives tarde à voir le jour. La mise en exécution de cette directive rencontre une résistance de la part des élus. Il faut ici remarquer que Hassi-R'mel est l'une des communes les plus riches d'Algérie après celle de Hassi-Messaoud du fait des revenus générés par l'impôt industriel. En effet, les ressources fiscales risquent d'être réduites après exurbanisation.

Par ailleurs, l'exurbanisation n'a pas eu d'impact sur la baisse des prix de l'immobilier et ce malgré, que Hassi-R'mel se trouve entièrement à l'intérieur du PEI, donc du risque. Contrairement à ce que d'autres chercheurs (Sauvage, 1997, Grislain & Latrémy, 2013) ont démontré, selon les sites d'annonces immobilières de l'année 2016, le prix d'un appartement de 100 m^2 à Hassi-R'mel atteint les sept millions de dinars algériens, tandis que celui d'une villa en propriété individuelle de 250 m^2 dans la ville de Bellil avoisine les quatre millions de dinars algériens.

La cession des biens immobiliers à Hassi-R'mel, initialement gérés par l'Office de la Promotion et de la Gestion Immobilière (OPGI), a transformé 600 habitants, de locataires en propriétaires. De plus, aucune disposition particulière n'a été instaurée quant à la gestion des transactions éventuelles de ces biens. De ce fait, ces biens sont soumis aux règles de spéculations pratiquées et en vigueur pour n'importe quel bien.

Ces facteurs réunis n'ont pas permis le détachement de ces lieux de résidence et ont engendré des stratégies opportunistes. Dans beaucoup de cas, le logement représente une source de revenu pouvant contribuer à améliorer les conditions de vie, notamment à travers les locations ou les plus-values réalisées par la vente de ces biens immobiliers. Ceci a creusé considérablement la disparité entre les deux villes du fait de l'absence de sensibilisation suffisante aux conséquences d'éventuels accidents industriels et de mesures strictes en matière d'expropriation tel que préconisé dans les directives du PDAU. La gouvernance de ce projet étant soumise à des décisions fortement centralisées n'a pas permis une gestion urbaine différenciée, dans laquelle il est fait appel à des outils d'aménagement spécifiques et appropriés.

Bien que Bellil ne jouit pas d'un statut de nouvelle ville, elle a été soumise aux mêmes conditions de création des villes nouvelles, qui en Algérie portent non pas sur un projet de territoire, mais sur des considérations plus matérielles et techniques (nature des sols et présence de ressources,

d'aménités et de réseaux, façades, espaces publics et équipements), donc comme un « terrain » (Sidi Boumediene et Signoles, 2017) ou une opportunité foncière pouvant servir d'extension par relogement (Hafiane,3 2007).

7.2.2. Sur le plan socio-économique

La liaison de Bellil avec les territoires pastoraux de la Wilaya de Laghouat lui attribue une vocation économique complémentaire. Cette spécificité secondaire favorise de nouvelles alternatives créatrices d'emploi et contribue à la relance économique de la région en dehors de l'industrie, notamment dans le cadre du soutien à l'emploi des jeunes.

Selon les statistiques de l'Agence Locale de Soutien à l'Emploi des Jeunes (ANSEJ) de la wilaya de Laghouat, la commune de Hassi-R'mel, à elle seule, a enregistré plus de 400 demandes de création de micro entreprises, dont plus de 80 sont opérationnelles et financées par l'État, d'autant plus que la population présente une importante tranche jeune, âgée de moins de 35 ans, estimée à 74%2 à la fin de l'année 2017. L'amélioration de l'aspect économique de la population délocalisée, se présente également dans les possibilités des sous-traitances qu'offre le pôle industriel, par les entreprises privées exerçant dans l'approvisionnement, l'intendance et les aspects logistiques.

Par ailleurs, le relogement a considérablement amélioré le cadre de vie des populations issues des zones d'habitat précaire. Le passage d'un habitat insalubre aux nouveaux lieux de résidence a offert, à ces populations, un cadre de vie décent et moins exposés aux risques. Les équipements scolaires disponibles, bien qu'ils soient relativement insuffisants, ont apporté une plus-value significative pour la stabilité des écoliers et des ménages.

Cependant, l'absence de données sociodémographiques précises, et de prise en considération des spécificités socio-culturelles et ethniques (origines bédouines et tribales), ainsi que la programmation quantitative standardisée, ont eu plusieurs conséquences négatives sur le nouveau cadre de vie. L'occupation spatiale, avant l'exurbanisation, était régie par des arrangements sociaux et des stratégies d'appropriation permettant la proximité entre lieu de résidence et lieu de travail. Après l'exurbanisation, ces arrangements se retrouvent déstructurés et soumis à de nouvelles logiques. Ainsi, 75,83% des habitants sont insatisfaits de la taille et des formes de logement au regard de la taille des ménages et du mode de vie traditionnel dominent. Ceci est visible à travers les transformations apportées aux logements et aux détournements d'usage des espaces extérieurs.

De plus, la population croissante et jeune souffre d'un taux de chômage de 10,12% à la fin de 2017 selon la monographie de la wilaya 2018. Ceci est aggravé par le manque de qualification des chefs de ménages, le taux d'analphabétisme, selon les enquêtes est de l'ordre de 15%. Ce phénomène social a pour conséquence la prolifération du commerce informel, en particulier en l'absence d'équipements commerciaux de proximité.

7.2.3. Sur le plan environnemental

Depuis sa création, la ville nouvelle de Bellil enregistre un manque important en eau. Les cadres de la direction de l'hydraulique de la Wilaya de Laghouat affirment un rabattement de la nappe phréatique entre 2008 et 2011.

Cette réalité confirmée par les études hydrogéologiques élaborées dans le rapport d'audit environnemental de Hassi R'mel effectué par les services de la SONATRACH en collaboration avec ERM France en date du 06 juin 2011, montre que la ville, qui n'est alimentée que par un seul puits situé à l'extérieur de son périmètre administratif, est menacée par un stress hydrique imminent. Par ailleurs, si le projet d'enfouissement technique des déchets représente un atout, l'absence d'un système de recyclage des eaux usées pourrait aggraver la situation par la contamination des sols.

[2] La monographie de la wilaya, direction de la programmation et suivi budgétaire de la wilaya de Laghouat, édition 2017.

L'exclusion de Bellil du périmètre d'exploitation par un simple geste graphique ne répond pas à l'objectif d'éloignement de la ville et du risque, et démontre l'incapacité des services techniques chargés de l'exécution du projet à asseoir une véritable stratégie urbaine en fonction du risque, et ce malgré l'existence du Plan Général de Prévention du Risque Majeur (PGPRM) et des plans particuliers d'intervention. Le choix de la localisation de la ville de Bellil à 30 kms de la ville de Hassi-R'mel répond plus à des exigences économiques et géostratégiques, qu'à des exigences environnementales et sociales.

Ainsi, l'emplacement de la nouvelle ville n'a pas fait l'objet d'une étude préalable fixant les limites du périmètre d'urbanisation en fonction du périmètre des risques. La ville de Bellil se trouvant sur le périmètre à risque, n'en fait pas une ville hors danger. Cette réalité remet en cause toute la planification prévue dans ces différents POS par les pouvoirs publics et met en exergue l'absence de coordination entre les secteurs de l'énergie, de l'environnement et de l'intérieur et des collectivités locales, et démontre le décalage entre le cadre juridique et réglementaire et leur mise en œuvre.

8. CONCLUSIONS

Ce n'est qu'après la catastrophe de Skikda que l'Algérie se dote de son arsenal juridique en matière d'environnement et de risque. La décision d'exurbanisation des infrastructures et des résidents de Hassi R'mel vers la ville de Bellil vient en application à cette nouvelle législation. En effet, s'il est impossible de déplacer le gisement et le champ d'exploitation, il semble plus facile de déplacer l'infrastructure et les populations.

Cependant, les différents facteurs, analysés et discutés supra, montrent la complexité que peut générer un processus d'exurbanisation et de séparation de la ville et du risque, notamment dans un contexte où les mécanismes de production urbaine sont fortement centralisés et peu maîtrisés.

En effet, la question de la maîtrise de l'urbanisation par l'éloignement du risque et des résidents est tributaire de plusieurs facteurs, particulièrement le facteur économique. Blésius (2014), dans sa recherche comparative entre le Québec au Canada et Vitry-sur Seine en France, affirme que le facteur socio-économique a un effet sur la cohabitation du risque et de la ville. Ceci confirme nos résultats, à savoir que la décision d'exurbanisation n'a pas été suivie d'un transfert effectif des infrastructures administratives de Hassi-R'mel vers Bellil du fait du risque de perdre les revenus générés par la fiscalité industrielle. L'expropriation par ailleurs priverait les propriétaires de logements autour du champ gazier d'une importante ressource financière étant donnée les prix élevés de l'immobilier, et pourrait provoquer le mécontentement des populations locales.

Au facteur socio-économique s'ajoute, pour le cas algérien, le facteur gouvernance. En effet, la mise en place d'un Plan Général de Prévention des Risques, sans l'annexer aux instruments d'urbanisme, comme c'est le cas pour les PPRT en France, n'a eu aucun effet sur le processus, étant donné que Bellil est restée imbriquée dans le périmètre d'exploitation. Ainsi, la prise de conscience du risque et sa réglementation ne suffisent pas, il y a lieu de privilégier une action concertée impliquant l'ensemble des acteurs et mettant l'importance du risque au centre des décisions.

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THE CORONAVIRUS PANDEMIC AND THE IMPACT OF ANTI-COVID-19 MEASURES ON THE POPULATION OF ROMANIA (MARCH 16, 2020 – MARCH 8, 2022)

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Key-words: pandemic, COVID-19, socio-demographics factors, measures, population.

Abstract. The study analyses the evolution of the Coronavirus (COVID-19) pandemic during the *States of Emergency and Alert* in Romania between March 16, 2020, and March 8, 2022, and the impact of the measures taken by the authorities on the population, as well as on the socio-economic, education and healthcare systems. The main demographic impact is related to the mortality rate, which was high among the population over 60 years of age, increasing the pressure on the healthcare system. The socio-economic impact triggered by the COVID-19 pandemic had medium and long-term effects: the loss of jobs, the economic crisis, a high unemployment rate, a limited access of the population to medical services, which has led to an economic decline in the field of transport, as well as school closures and switching to online courses for longer periods of time, while companies switched to remote working and made investments in the digitization of services.

1. INTRODUCTION

The SARS CoV-2 virus infection appeared in December 2019 in the city of Wuhan, China. The World Health Organization (WHO) announced on March 11, 2020 that the coronavirus epidemic was officially classified as a *pandemic*, since more than 118,000 cases had been registered in 114 countries, with 4,291 deaths reported worldwide (WHO, 2020). The official name for the new coronavirus was **SARS-CoV-2** (severe acute respiratory syndrome coronavirus 2), and the name for the disease it caused was **COVID-19**. The most vulnerable population category to this disease is the elderly and/or with people with comorbidities.

Some of the measures taken by the Romanian authorities to combat infection with the coronavirus during the state of emergency and alert in Romania between March 16, 2020 – March 8, 2022 were:

- on January 22, 2020, six hospitals were designated where COVID-positive patients would be to be hospitalized – the infectious diseases hospitals in Iași, Timișoara, Constanța, Cluj, together with the "Prof. Dr. Matei Balș" National Institute of Infectious Diseases and the "Victor Babeș" Clinical Hospital for Infectious Diseases, both in Bucharest –; thermal scanners were installed in all airports, an interministerial committee was established for the monitoring and management of potential COVID infections, the 24/7 presence of medical personnel in the airport medical offices was ensured, a passenger questionnaire was drawn up, kits were purchased for the quick diagnosis of suspected cases, medical and protective equipment, isolettes, disinfectant etc. were purchased.
- on February 26, 2020, the first case of infection with the new coronavirus was confirmed on Romanian territory; the Minister of Health issued an order for quarantining persons given the international public health emergency situation triggered by the COVID-19 infection, a measure applicable to all asymptomatic persons returning from areas with extensive community transmission (www.mai.gov.ro).

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- on March 7, 2020, the first coronavirus case was confirmed in Bucharest.
- The National Committee for Special Emergency Situations decided to suspend the teaching process between March 11–22, 2020, while also taking into consideration the possibility of extending that period; road passenger transport was suspended for all routes to and from Italy (starting March 10), as well as rail transport (starting March 12). Food establishments and public and private providers of passenger transport were obliged to frequently disinfect surfaces and to avoid the amassing of crowds in commercial areas.
- on March 16, 2020, decree no. 195/2020 was issued regarding the establishment of ***the state of emergency*** on the territory of Romania for a period of 30 days, which as subsequently extended until May 14, 2020 by decree no. 240/14.04.2020.
- on March 17, 2020, *the first Military Ordinance* was issued regarding some first-degree emergency measures concerning crowds and the cross-border movement of certain goods. Following the 3/24 March 2020 Military Ordinance, drastic restrictions on the movement of people were imposed, restaurants and hotels were closed, public events in enclosed spaces were prohibited, only events of under 100 participants in open spaces were allowed, the mobility of the population was limited, air and land transport were subject to restrictions, quarantine measures were imposed for those coming from abroad, scheduled hospitalizations were limited in hospitals because of the degree of occupancy of hospital beds, the temporary suspension (6 months) of the outbound distribution of medicines and essential materials in the prevention and treatment of conditions associated with the infection with COVID-19.
- the first COVID-19 death was registered on March 22, 2020, that of a 67-year-old patient with very serious pre-existing conditions (cancer), hospitalized on March 18 at the ER of Filiași Hospital and transferred on the same day to IDCH Craiova (COVID19.stirioficiale.ro).
- on March 30, 2020, the municipality of Suceava and its neighboring area consisting of eight municipalities – Adâncata, Salcea, Ipotești, Bosanci, Moara, Șcheia, Pătrăuți and Mitocu Dragomirnei – were quarantined. The restriction was lifted on May 13, 2020.
- on May 15, 2020, the law regarding the establishment of a ***state of alert*** at the national level for a period of 30 days was passed through Government Decision no. 24/2020, and later extended until March 8, 2022, when it was repealed by Decision no. 16 (www.mai.gov.ro).

In March and April 2020, in the context of the COVID-19 health crisis, Latvia, Romania, Armenia, the Republic of Moldova, Estonia, Georgia, Albania, North Macedonia, Serbia and San Marino notified the Secretary General of the Council of Europe of their decision to activate Article 15 of the European Convention on Human Rights (ECHR), which had the effect of terminating the protection provided by international human rights law (Braithwaite, Harby, Miletic, 2021). These states were joined by France, Greece, Ireland, Turkey and the United Kingdom (www.irdo.ro). However, the activation of this article did not allow the derogation from the articles of the Convention that protect the right to life and prohibit torture and slavery. Since its accession to the ECHR, Romania had never suspended the European human rights protection system.

The fundamental rights that were affected or restricted by Romania, during the pandemic, according to the presidential decrees issued during the state of emergency, were the following: the right to free movement, the right to the protection of one's private and family life, the inviolability of the one's home, the right to getting an education, the freedom of assembly and association, the right to the protection of one's private property, the right to go on strike, one's economic freedom. According to article 48 letter b) of decree 195, the Ministry of Foreign Affairs has the task of notifying the Secretary General of the UN and the Secretary General of the Council of Europe regarding the measures taken as triggered by the decree establishing the state of emergency, which had the effect of limiting the exercise of various fundamental rights and freedoms (www.juridice.ro).

Going to the grocery store, the doctor's office or to work could only be done by filling out a personal statement, and if the person was over 65, they could only go out for two hours a day. Going out at night was also strictly prohibited and wearing a surgical mask became mandatory. Schools were closed indefinitely, and in order to avoid the cancellation of the entire school year, they switched to online education. Gloves, disinfectants, temperature measuring devices were also used.

The measures imposed by the authorities had a major impact on the entire social and economic life, and often led to the total or partial interruption of the activity of various economic operators, triggering financial difficulties and even the risk that certain economic operators might disappear from the market (www.icj.ro). Economic activities which had been suspended in March 2020 began to gradually resume starting May–June 2020, under increasingly strong economic and social pressures (Simionescu *et al.*, 2021). The pandemic exposed the vulnerability of economies to highly infectious diseases (Caselli *et al.*, 2021; Tisdell, C.A., 2020).

2. DATA AND METHODS

The study analyses the evolution of the Coronavirus pandemic during the state of emergency and alert – between March 16, 2020 and March 8, 2022 – and the impact of the measures taken by the authorities on the population, as well as on Romania's socio-economic, education and healthcare systems.

The study made us of multiple data:

a) the selection of statistical indicators: the LAU database, the Tempo Online data series published by the National Institute of Statistics in 2019, 2020, and 2021, datelazi.ro, dspb.ro; vaccinare-Covid.gov.ro.

b) building the database, graphs and maps regarding the number of COVID-19-infected people, the cumulative incidence of cases at county level / 14 days / ‰ of inhabitants, the number of persons vaccinated by county (%), the number of vaccinated people by locality (%), the number of deaths (total number of persons), the number of deaths categorised according to the main cause of death; the number of people who died from COVID-19.

c) the research is based on the thorough study of the bibliography from the national and international scientific literature regarding the COVID-19 pandemic.

3. RESULTS AND DISCUSSIONS

3.1. Social protection policies

In 2020, the Romanian economy recorded one of the biggest contractions in Europe, 12.3% (according to Eurostat), only falling behind the states whose GDP is largely based on tourism (Spain, Croatia, Greece, Hungary, Portugal, France, Italy). Primary resource processing and car manufacturing were among the sectors that were hit the hardest by the recession, and the service sector was subject to pandemic-related restrictions (https://www2.deloitte.com). The economic crisis was mainly a supply crisis, as many companies were forced to reduce their activity. The COVID-19 pandemic forced many companies to close, resulting in an unprecedented trade disruption in most industry sectors (Donthu, Gustafsson, 2020), causing a massive economic shock due to business interruptions (Martin *et al.*, 2020); the worldwide economy has become anxious and uncertain (Louhichi *et al.*, 2021).

Access to health benefits, sickness and unemployment benefits has gained relevance during the pandemic. The implementation of the authorities' response to the pandemic was more difficult for low-income countries, which were not prepared (www.ilo.org).

As a member of the European Union and in order to access the financial recovery package, Romania had to rely on two pillars: ecological transition and digital transformation, with a view to promote cohesion and strengthen the resilience of the European Union. Digital transformation is essential for the business environment characterized by high competitiveness (Albu *et al.*, 2020).

The war against the pandemic forced governments and central banks to massively intervene in the economy to limit the damage (Dăianu, 2021). The Government of Romania took a series of measures to support the economy, the population, to protect health and to maintain jobs: postponing the payment of some tax obligations on the part of various economic agents during the crisis, postponing the payment of the specific tax or for utility services, such as electricity, natural gas, water, telephone and internet services and the payment of rent as well as state guarantees for loans and other grants, granting amounts to employers for the settlement of a part of the gross salary of the employees they decided to keep on (41.5%), providing technical unemployment allowances from the unemployment insurance budget within the limit of 75% of the average gross salary, granting allowances to parents for the supervision of children during the temporary closure of educational institutions, cancelling interests, penalties and all adjacent expenses related to outstanding main budget obligations, instituting work-from-home policies – one of the methods of organizing production and company services, and implicitly employment, requesting the postponement of payments for social contributions and taxes and financial aid for struggling small and medium-sized companies, which make up the foundation of the domestic economy, extending the validity of holiday vouchers; enabling online professional training activities, which have been recognized by the Ministry of Labor and Social Protection etc. (mfinante.gov.ro). Among the most vulnerable population categories the following stood out: incomplete families, urban families, people with a lower education level, low-income families.

Employment contracts were suspended, most of them in the following fields: the manufacturing industry, wholesale and retail trade, motor vehicle and motorcycle repair, as well as hotel and restaurant services, which accounted for more than 50% of the suspended contracts. One of the sectors most affected by the pandemic was tourism, due to the quarantine which limited the free movement of people, making access to tourist attractions impossible (Mitrică *et al.*, 2022). To mitigate the effects of the reduced activity during the pandemic, the decision was made to grant financial aid and reduce specific taxes for HoReCa businesses (Munteanu *et al.*, 2022).

The government adopted a set of social protection measures for employees during the pandemic, so that jobs could be saved, while also supporting the struggling economic sectors. The employees whose economic activities were suspended, limited or prohibited due to the COVID-19 pandemic received technical unemployment until March 31, 2022.

Consequences for the labour market:

- digital transformation has given workers greater freedoms, such as flexible working hours and work patterns that adapt to suit the individual.
- digitization requires more skills and qualifications on the side of the employees.

The Coronavirus pandemic has highlighted the need to accelerate digital transition in Europe. Capitalizing on the opportunities of this transition is essential for strengthening the economic base and competitiveness, facilitating the ecological transition, creating jobs and improving the lives of citizens (www.zf.ro).

In Romania, the effects of the economic crisis were felt through a depreciation of the national currency in relation to the euro, an evolution that was felt in bank loan rates, in higher telephone or utility bills, as well as in the real estate or car sector (www.forbes.ro). The impact of the Coronavirus pandemic has had a number of effects on the labor market: more women than men have lost their jobs, since they mainly work in fields that have been affected by closures or restructuring, such as the tourism sector, consumer industry, trade, HoReCa, and low-income earners were hit harder than middle and high earners.

3.2. The Coronavirus epidemic and the impact on the education system

On March 11, 2020, classes were suspended, initially for a period of 2 weeks. Once the state of emergency was declared, the online education system was introduced. After the abrogation of the state of emergency, only the students in their final years returned to classes, and only in compliance with the sanitary protection rules. Courses were organized to prepare teachers for online teaching, students were marked as absent if they did not participate in online classes, recording live courses was prohibited, while the *Teleşcoala* program, in partnership with the TVR Romanian Television, offered courses to students in the 8^{th} and $12^{th}/13^{th}$ grades in order to help them sit the national exams etc.

Worldwide, the disruption of education systems has led to millions of children losing the chance of learning significant information that they would otherwise have learned had they been physically present in the classroom, with children from vulnerable social backgrounds and young children registering the greatest losses (www.unicef.org/romania/ro).

At the opening of the 2020–2021 school year, the Romanian government adopted the solution of decentralization and delegation of decisions at regional and local level. A series of measures were taken to enable the functioning of the education system: the mandatory wearing of protective masks, the minimum distance of 1 m between students, disinfecting spaces, installing plexiglass panels, providing protective equipment, adding extra educational spaces, covering the technological needs of teachers and students, offering online and hybrid lesson models, providing technical, educational and psychological support etc.

In the event of the temporary closure of educational institutions, parents were granted days off to be able to supervise their children for all working days during the state of emergency, benefitting from an allowance of 75% of the gross monthly salary, but not higher than 75% of the average gross monthly salary at the national level. This measure affected the economy, generated criticism from businesses and led to in-person learning becoming mandatory in the second part of the pandemic era, when high COVID incidences were being recorded (https://www.mai.gov.ro/wp-content/uploads/2020/).

At the European level, the measures to close schools and universities were mainly taken in March and April 2020. In April, 80%, i.e., 25 of the 31 European countries (EU, EFTA EFTA, UK) partially or totally closed preschool education, 90% (28 countries out of 31) closed primary schools, and 100% closed high school and university education (all 31 countries). Starting May 2020, most countries decided to partially reopen schools (https://www.stepbystep.ro). Complete school closures occurred only in Belgium, Germany, Ireland, Greece, Portugal, Montenegro, North Macedonia and Turkey (European Commission / EACEA / Eurydice, 2022).

The World Health Organization recommends in its documents the adoption of a system based on risk analysis, a system that takes into account several factors when deciding to reopen schools: epidemiological factors, the state and capacity of the public healthcare system, community participation, as well as the government's ability to provide social and economic support to the most disadvantaged categories.

On September 14, 2020, schools reopened, after a 6-month hiatus, for most students, except for those in the final years who continued their in-person activity at school, after the repeal of the state of emergency (Săgeată, 2022). Three traffic light-type school operation scenarios were implemented:

- *scenario 1* (green) – the in-person presence of all students in class (infection rate of < 1‰);
- *scenario 2* (yellow) – the in-person presence of preschoolers, students from grades 0 through 4 and students in their final years (infection rate between 1–3‰);
- *scenario 3* (red) – classes were held exclusively online (infection rate > 3‰).

Measures and protocols were approved to ensure the application of sanitary rules: cleaning and disinfection measures, the clear marking of entry and exit routes, wearing a protective mask, assigning and not exchanging student seats; ensuring a distance of at least 1m between students/preschoolers, the self-isolation of students at home if they displayed specific COVID-19 symptoms etc.

Scenarios for returning to school from May 5, 2021:
- *scenario 1* – the in-person presence of all students in class (infection rate < 1‰);
- *scenario 2* – the in-person presence of preschoolers, students in primary education and in their final years (infection rate > 1‰).

If the occurrence of one or more cases of COVID-19 was confirmed at the level of an educational unit, the class or the entire unit ran the risk of being closed for 14 days, with all learning activities being carried out online.

In February 2021, the Minister of Education announced the reopening of schools and the scenarios for them, with students being able to go to school in person as long as the infection rate was under 6/1000 inhabitants: all educational units where the vaccination rate was below the 60% threshold, in localities with an incidence of over 3‰, would have to switch to online classes. This threshold was removed in October 2021, and students were allowed to go to school irrespective of the infection threshold in the locality but depending on the degree of vaccination of school employees, which should not have been lower than 60%.

The structure of the school year was also altered, and students found themselves having two forced holidays: one in April 2021 when they had two weeks off by combining the holidays for Orthodox and Catholic Easter, and another in October 2021.

Compared to other countries in Europe, Romanian schools had the longest closure period, when students underwent online learning (European Commission / EACEA / Eurydice, 2022). Some children did not attend online classes because they did not have the technical means to be able to connect online, so the solution was to distribute tablets and free data subscriptions to the vulnerable, or to distribute printed materials. It was necessary to train teachers to increase their ability to convey information. The teaching staff had a triple role: as a teacher, as a manager of health protection measures and as a network administrator (Săgeată *et al.*, 2023).

Some of the risks noted during the pandemic were: children dropping out of school because some parents thought it was too dangerous to take them to school, some students were unable to go online because they did not have internet access or the digital means of logging into classes.

It was concluded that the closing of schools also had serious effects on society in general, not only on children, leading to the deepening of inequality in society, as well as to losses of personal and social income, due to the subsequent decrease of the GDP of the countries hit by the pandemic (www.ecdc.europa.eu). A negative effect had to do with the lack of access to technology and with poverty. Almost half of Romania's children live under the poverty line, and technology, if present, is used mostly by adults.

3.3. The Coronavirus epidemic and the healthcare system in Romania

The Romanian healthcare system had been up against great difficulties for quite a few years, but the situation took centre stage due to the crisis caused by the pandemic. Romanian governments annually distribute between 5–6% of the GDP to the public healthcare system i.e., approximately 600 euros/person, while the EU average is five times higher (www.dw.com/ro). One cause of the issues the healthcare system faces is its politicization, with hospital managers and heads of public health departments being appointed based on political criteria. Both before and during the pandemic, the main struggle was the lack of specialized staff, especially doctors and intensive care nurses (Damian *et al.*, 2022).

Medical systems were faced with an unprecedented situation: services had to be reorganized, scheduled hospitalizations and surgical interventions were reduced, PPE was purchased, digital technologies were adopted, remote medical services were established, outpatient monitoring outside conventional clinics was underway, drive-through test points were organized; temporary vaccination centres were set up etc.

All hospitals in the country had to deal with their first restrictions, having to reduce by up to 80% their scheduled hospitalizations and scheduled surgical interventions for chronic patients in inpatient health units part of university centres, and to reduce outpatient activity by up to 50% compared to February 2020 (legislatie.just.ro).

At the national level, following a first order of the Minister of Health, hospitals were established specifically designed to treat COVID cases, together with support hospitals, as well as those designed for non-COVID cases. Hospitals dedicated to COVID-19 patients were clustered in certain counties, while in other areas the number of hospitals/county remained below the national average.

The strategy of the Ministry of Health was to acquire PPE, the equipment necessary for treatment, assess and increase testing capacity, preparing the hospitals etc. On May 29, 2020, the Ministry of Health decided to resume admissions, scheduled surgical interventions, as well as activity in outpatient clinics, depending on the local epidemiological evolution.

The number of hospitalizations at the national level decreased starting April 2020, when there were 70% fewer hospitalizations than in the same period of the previous year. The number decreased further between June and August 2020: Matei Balş Institute and Colentina Hospital, both in Bucharest, were among the most affected public hospitals, with considerable reductions (-90%) in the number of hospitalizations being registered between March and August 2020, compared to the same period of the previous year, a 50% decrease in the number of hospitalizations for tuberculosis patients, and a 46% decrease in the number of hospitalizations for oncology patients (observatoruldesanatate.ro).

Romanians postponed or avoided visiting the doctor during the coronavirus epidemic. This behaviour was driven by financial or emotional reasons (a low income, a fear of contracting the virus or receiving a worrying diagnosis). Almost half of Romanians living in the urban environment reduced their visits or entirely avoided going to their family doctor or to a specialist doctor. Thus, according to a study carried out in the Spring of 2021, 54% of family doctors and 68% of specialists interviewed noticed an increase in the number of emergencies/aggravation of conditions for patients suffering from chronic illnesses (www.ipsos.com).

On March 31, 2020, the number of people hospitalized infected with the coronavirus was 2,254, 62 of which were in the ICU. The maximum value for 2020 recorded on November 30, 2020 was 13,261 people hospitalized and 1,251 in the ICU. In 2021, the values recorded fairly large fluctuations corresponding to the waves of infection that characterized this pandemic: 7,763 people hospitalized, 997 in the ICU, on March 31, 2021, there were 13,248 people hospitalized and 1,412 in the ICU; the maximum value for 2021 was recorded on October 31, 2021, with 20,005 people admitted to the COVID wards, 1,874 of which were in the ICU. The lowest values were registered on July 31, 2021: 403 people hospitalized, 56 of which were in the ICU. At the end of 2021, the situation was as follows: 2,322 people hospitalized, 399 of which were in the ICU, on March 8, 2022, 4,176 new cases were registered; 4,340 people were admitted, 633 of which were in the ICU, according to COVID19.stirioficiale.ro data.

According to data from the Romanian Health Observatory, the Coronavirus pandemic has made it difficult for the chronically ill in Romania to access treatment, more than half of patients not receiving the necessary treatment. This has led to a deteriorating state of health of the population and to increased pressure on an already overwhelmed medical system.

3.4. The Coronavirus epidemic and the demographic impact

The impact of the Coronavirus pandemic has highlighted the weaknesses of healthcare systems, public funding should be a priority for healthcare services, as should be strengthening the access to essential public healthcare services.

The evolution of SARS-CoV-2 cases was relatively slow, in the first two weeks after the detection of the first case the number of those infected was under 50. Between February 26, 2020 and March 8, 2022, the total number of COVID-19 cases in Romania increased from 1 to 2,781,086 total confirmed cases (Fig. 1). The city of Bucharest ranks first with 520,326 cases, followed by the counties of Cluj, Timiș, Ilfov, Constanța, Iași and Brașov with over 100,000 cases each; the counties with the lowest number of reported positive cases were: Covasna (18,988), Tulcea (20,147) and Harghita (21,089). Because of their demographic amplitude, Bucharest (the Capital city) together with other counties where the largest Romanian cities are located were potentially exposed to the SARS-CoV-2 virus infection (Mitrică *et al.*, 2021). During the analysed period, an exponential growth trend of positive cases can be noted, the trend becoming quite obvious especially starting November 2020.

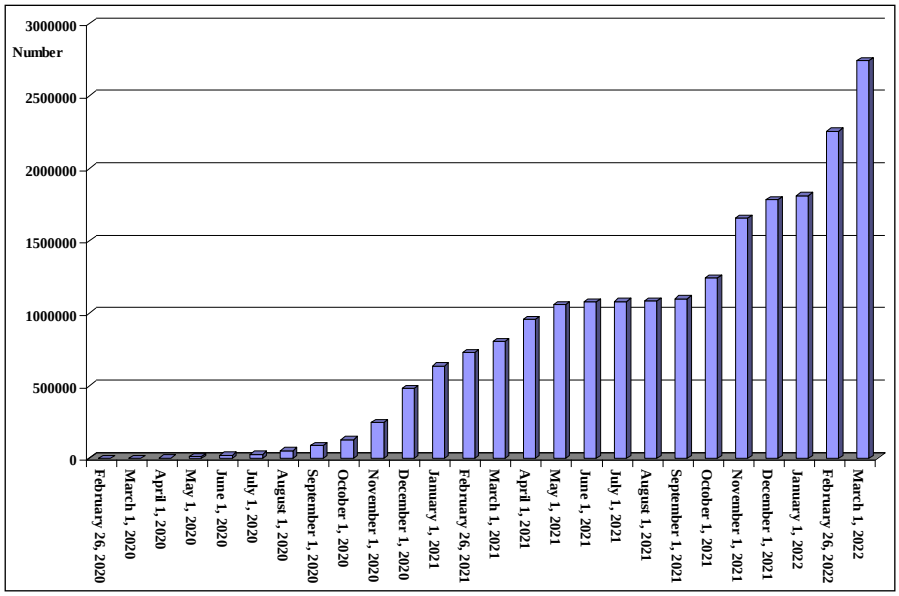

Fig. 1 – The evolution of COVID-19 cases (26.02.2020 – 1.03.2022).
Source: https://www.worldometers.info/coronavirus/country/romania/.

On July 15, 2020, the number of people confirmed as being infected with the coronavirus reached 34,226, the number of those hospitalized in the ICU being 248; the number of processed tests was 886,918, while the number of people who died as a result of the COVID-19 infection reached 1,952. Most counties (32) had a small number of infections, below 1,000 cases each. The minimum values (under 200 cases) were in the counties of Satu Mare, Sălaj, Caraș-Severin and Vâlcea (Fig. 2). The maximum value was recorded in Suceava County (4,200 cases), followed closely by the Municipality of Bucharest (approximately 4,000 cases).

The number of people confirmed positive at the national level increased very quickly – by approximately 600,000 cases – within five months, so that on December 31, 2020 it reached 629,018. 4,322 new cases (people who had not previously had a COVID-positive result) were registered. In specialized health units, the number of people admitted suffering from a COVID-19 infection was 9,124, 1,130 of which were admitted to the ICU. The number of people who died rose to 15,767.

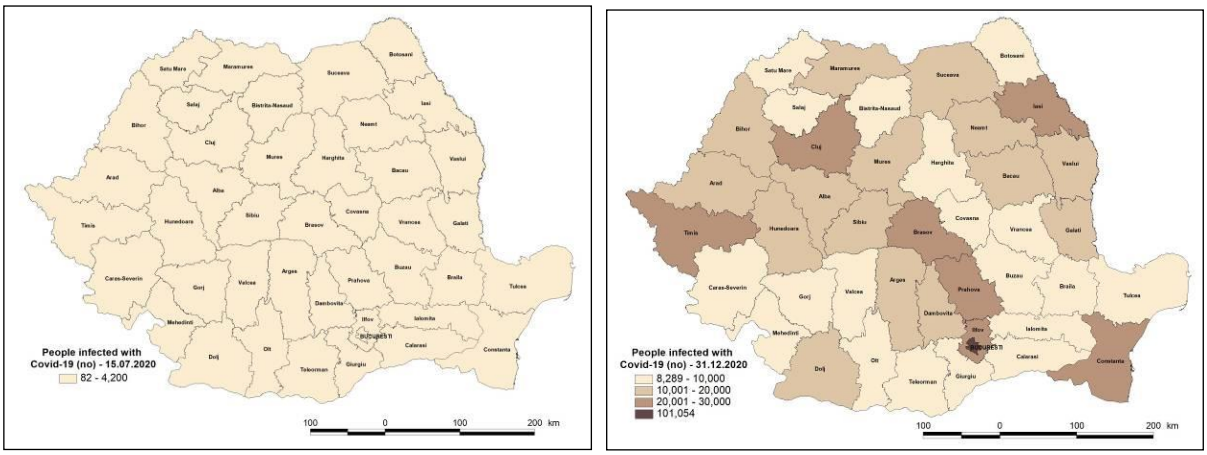

Fig. 2 – The number of people infected with COVID-19 (15.07.2020; 31.12.2020).
Source: COVID19.stirioficiale.ro.

Regarding the distribution of cases by county, the situation was as follows: Bucharest City together with 7 other counties – Cluj, Iași, Constanța, Timiș, Brașov, Prahova and Ilfov – had 45% of the total number of infections in Romania (282,896 cases). The counties with the lowest numbers of infections – approximately 5,000 cases – were Mehedinți, Covasna and Gorj.

On July 15, 2021, the number of people infected with the new coronavirus (COVID-19) was 1,081,467. The number of cured patients was 1,046,610, and the number of deceased people was 34,425. Up to that time, 8,515,041 RT-PCR tests and 1,630,177 rapid antigen tests had been processed at the national level. The counties with the highest number of positive tests were Brașov, Timiș, Cluj and the Municipality of Bucharest. The lowest number of people infected with COVID-19, under 10,000 cases, was registered in Harghita, Mehedinți, Tulcea, Covasna and Gorj (Fig. 3).

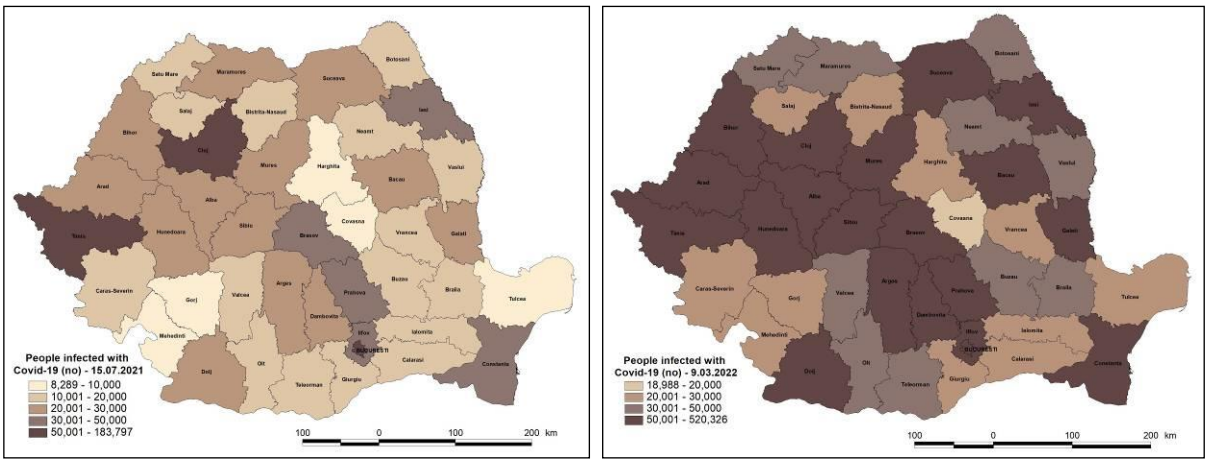

Fig. 3 – The number of people infected with COVID-19 (15.07.2021; 9.03.2022).
Source: COVID19.stirioficiale.ro.

On November 15, 2021 there were 1,744,440 people infected with COVID-19, 1,587,856 cured patients, and 53,264 deceased. Up to that time, 10,540,874 RT-PCR tests and 4,912,799 rapid antigen tests had been processed at the national level. In specialized health units, the number of people admitted with COVID-19 was 15,189, 1,720 of which were admitted to the ICU. Also, during the same period, Covasna, Tulcea and Harghita were among the counties with the minimum number of infected people. At the

opposite end of the spectrum, the leading counties in terms of the number of infections were the Municipality of Bucharest (with approximately 300,000 cases), followed by Cluj and Timiș.

On January 11, 2022, 1,857,502 COVID-19 cases were registered. 1,760,487 patients were deemed cured. The number of people admitted to hospital infected with COVID-19 was 3,023, and 415 people were admitted to the ICU. The lowest number of people infected with COVID-19 was also recorded in the previously-mentioned counties: Covasna, Tulcea and Harghita. The municipality of Bucharest recorded the maximum value of 317,540 infections.

The coefficient of cumulative infections / 14 days / 1,000 inhabitants is calculated by the Public Health Directorates, at the level of the Municipality of Bucharest and each of the counties. The 14-day incidence rate was analysed between November 1, 2020 and March 8, 2022. The highest values were recorded on December 1, 2020, April 1, 2021, November 1, 2021 and February 1, 2022. The lowest values were between June 1 – September 1, 2021 and on January 1, 2022.

The COVID-19 incidence rate on March 8, 2022 (when the state of alert ended) had the lowest values in the counties of Suceava (0.83‰), Harghita (0.94‰) and Neamț (1.03‰). The maximum values were recorded in the counties of Cluj (8.82‰), Ilfov (8.98‰) and the Municipality of Bucharest (13.41‰) (Fig.4).

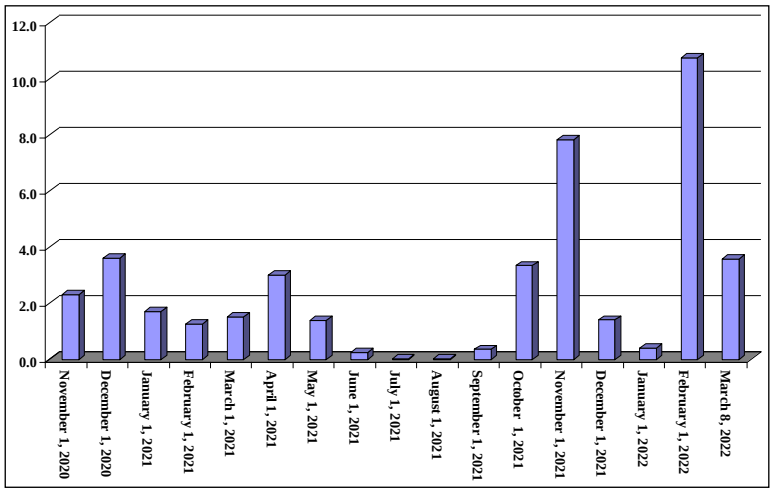

Fig. 4 – Cumulative incidence of cases at county level / 14 days / ‰ inhabitants (1.11.2020–8.03.2022).
Source: COVID19.stirioficiale.ro.

3.5. COVID vaccination in Romania

Vaccination in Romania against the COVID-19 infection started on December 27, 2020. Three stages were established: stage 1 – the vaccination of people working in the healthcare and social industries, stage II included the high-risk population and the workers carrying out activities in key, essential fields, while stage III included the general population. When establish the population groups, the following criteria were taken into account: the principles of ethics and social equity, epidemiological criteria, medical criteria, the risk of SARS-CoV-2 infection, essential activities etc. (vaccinare-COVID.gov.ro). The goal of the vaccination campaign was to maintain the basic essential services of society while putting a stop to the transmission of the virus (Mocanu *et al.*, 2021). The European Commission set out the strategy to accelerate the development and deployment of vaccines against COVID-19 (ec.europa.eu/commission/).

The vaccines that were administered on the territory of Romania were the following:

– the Pfizer BioNTech vaccine administered on December 27, 2020. The total number of people vaccinated that day was 2,066. The booster dose was administered starting September 28, 2021 (Table 1).

– the Moderna vaccine administered on February 4, 2021;
– the AstraZeneca vaccine administered starting February 15, 2021;
– the Johnson&Johnson vaccine administered starting May 4, 2021 – a single dose.
– the Pfizer Pediatric vaccine was administered starting January 26, 2022.

Table 1

Anti-COVID-19 vaccines authorized in Romania

Vaccine/Producer Vaccine name Technology used	**Number of doses** The period until booster dose (dose 2)	**Recommended age**
PFIZER BioNTech Comirnaty messenger RNA	2 doses (0,3 ml/dose) 21 days (3 weeks)	Persons over 12 years of age
MODERNA Spikevax (previously the Moderna COVID-19 Vaccine) messenger RNA	2 doses (0,5 ml/dose) 28 days (4 weeks)	Persons over 12 years of age
ASTRAZENECA/OXFORD Vaxzevria (previously the AstraZeneca COVID-19 Vaccine) Non-replicating viral vector	2 doses (0,5 ml/dose) 4–12 weeks	Persons over 18 years of age
JANSSEN/JOHNSON& JOHNSON	1 dose (0,5 ml/dose)	Persons over 18 years of age

Source: https://vaccinare-COVID.gov.ro/.

On February 2, 2022, the percentage of the vaccinated population in Romania was as follows: general population – 41.85%, the population eligible for vaccination (5+) – 44.62%, and the adult population (18+) – 50.43%. The situation in residential areas was as follows: rural areas – 29.69%, urban areas – 41.69%, and municipalities – 43.05%. On December 5, 2021, the situation was as follows: rural areas – 25.05%, urban areas – 40.53%, and municipalities – 42.33%.

According to the data made available to the National Committee for the Coordination of Vaccination Activities against COVID-19 (CNCAV) by the National Institute of Public Health (INSP-CNSCBT) with the help of the National Electronic Register of Vaccinations (RENV) application, which keeps track of vaccinations from the start of the vaccination campaign, from December 27, 2020 until March 8, 2022, the situation was as follows: 16,728,347 vaccine doses were administered. The number of persons vaccinated with the first dose was 8,114,789, while the number of fully-vaccinated persons was 8,077,224; the number of persons vaccinated with the booster dose was 2,544,181 (Table 2).

Table 2

Persons vaccinated on March 8, 2022

Vaccine type	**Total no. of doses administered since December 27, 2020**	**Total no. of persons vaccinated with the first dose***	**No. of fully-vaccinated persons**	**No. of persons vaccinated with the booster dose**
Pfizer	12,805,375	5,256,766	5,236,888	2,311,718
Pfizer Pediatric	15,747	8,959	6,788	0
Moderna	1,009,169	408,021	406,542	194,606
AstraZeneca	852,364	433,193	419,156	15
Johnson&Johnson	2,045,692	2,007,850	2,007,850	37,842
TOTAL	**16,728,347**	**8,114,789**	**8,077,224**	**2,544,181**

* It includes vaccinations administered with Johnson&Johnson as a booster dose, but also as the secondary dose as part of the heterologous schedule, following the update of reports in RENV.
Source: https://stirioficiale.ro/informatii.

On May 26, 2021, the share of the population vaccinated with at least one dose was approximately 25% of the total eligible population. At county level, the maximum values were registered in Timiș – 25.1%, Brașov – 25.72%, Sibiu – 26.8%, Cluj – 33.2%, and the Municipality of

Bucharest – 36.1%, while the minimum values were recorded in Suceava – 11.7%, Botoșani – 12.4%, Giurgiu – 12.7%, Bacău – 13%, and Neamț – 13.6% (Fig. 5).

At locality level, the lowest vaccination values, below 0.5%, were registered in Bărbulești (Ialomița County) and Cămârzana (Satu Mare County). The maximum values of vaccinated people, over 40%, were recorded in Cluj-Napoca (Cluj County), Borsec (Harghita County) and Dumbrăvița (Timiș County).

On July 5, 2021, the percentage of the vaccinated population increased to approximately 30%. The counties with the lowest rates of vaccinated people are, with small differences, the same as those recorded on May 26, 2021: Suceava, Botoșani, Bacău, Giurgiu and Covasna. Conversely, the City of Bucharest has highest value (approximately 40%) of vaccinated population, followed by the counties of Timiș, Brașov, Sibiu and Cluj.

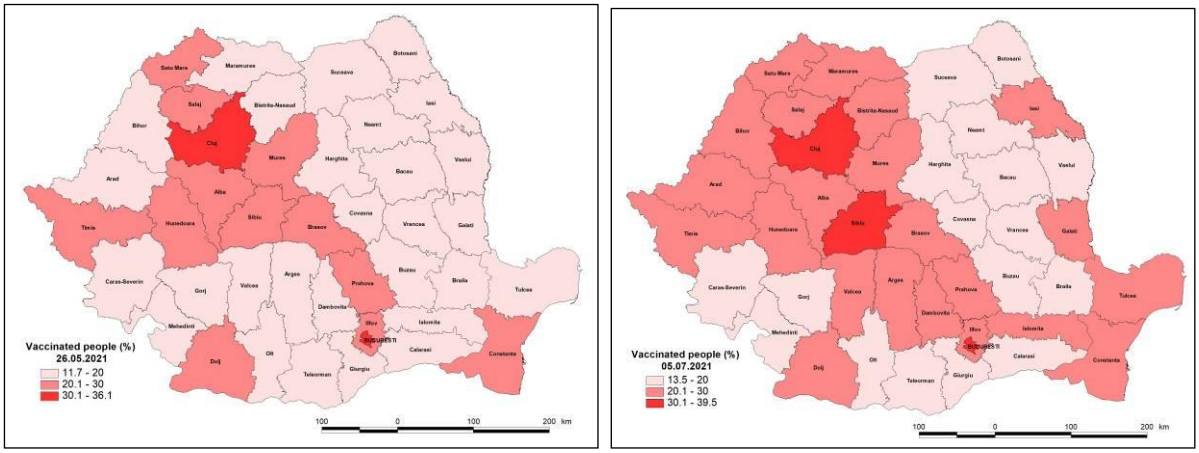

Fig. 5 – The percentage of vaccinated people by county (26.05.2021; 5.07.2021).
Source: https://vaccinare-COVID.gov.ro/situatia-vaccinarii-in-romania/.

At the administrative unit level, the lowest values of vaccinated people were registered in the localities of Bărbulești (Ialomița) – 0.21% and Câmârzana (Satu Mare) – 0.72%. The maximum values – over 40% vaccinated population – were recorded in Foieni (Satu Mare), Giroc (Timiș), Valea Lupului (Iași), Râmetea (Alba), Cluj-Napoca (Cluj), Borsec (Harghita) and Dumbrăvița (Timiș) (Fig. 6).

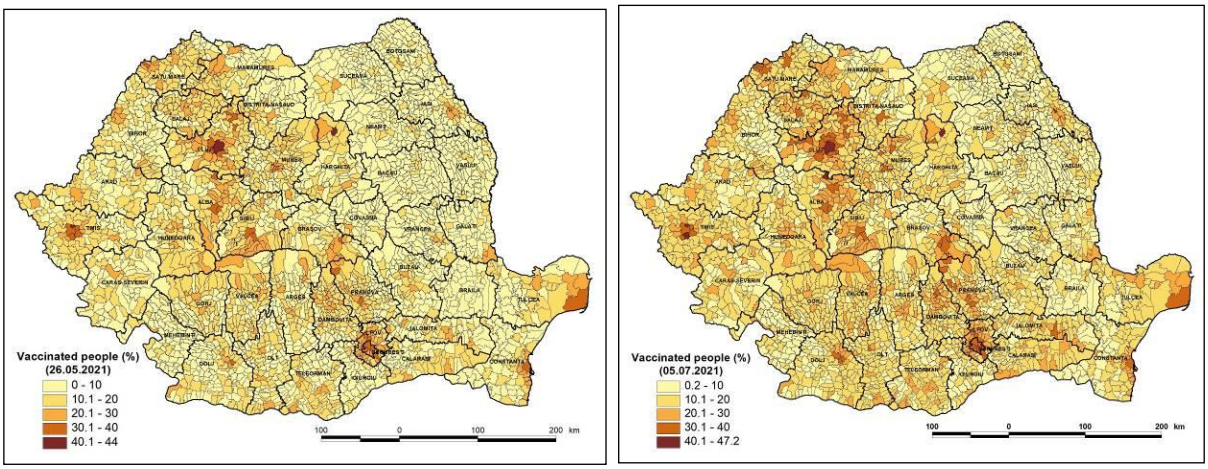

Fig. 6 – The percentage of vaccinated people by locality (26.05.2021; 5.07.2021).
Source: https://vaccinare-COVID.gov.ro/situatia-vaccinarii-in-romania/.

On October 5, 2021, the vaccination coverage of the eligible population over 12 years of age was 52.77% for the municipality of Bucharest, followed by 47.85% for Cluj, and 40.96% for Sibiu; 17 counties had a vaccination coverage rate between 30–39.9% and 22 counties ranged between 20–30% vaccination coverage. More than 5.64 million people were vaccinated with at least one dose; 5.45 million people were fully vaccinated and 228,865 people had the booster dose. In the 60–69 and 50–59 age groups, the vaccination coverage rate was over 40% (https://gov.ro/ro/stiri/conferinta-de-presa).

The highest percentages were recorded in the following counties: Timiș – 38.95%, Constanta – 39.82%, Sibiu – 40.96%, Cluj – 47.85%, and the Municipality of Bucharest – 52.77%, while the lowest values were recorded in Suceava – 20.60%, Giurgiu – 21.07%, Covasna – 21.88%, Bacău – 22.52%, and Botoşani – 22.34% (Fig. 7).

At the locality level, Dumbrăvița commune in Timiş County is the only one in the country where the percentage of the population that had received the COVID vaccine was over 50%. 16 localities have vaccination rates between 41.0% and 47.2%: Sfântu Gheorghe (Tulcea), Popești-Leordeni (Ilfov), Subcetate (Harghita), Moșnita Nouă (Timiș), Foieni (Satu Mare), Chiajna (Ilfov), Corbeanca (Ilfov), Florești (Cluj), Feleacu (Cluj), Otopeni (Ilfov), Borsec (Harghita), Cârcea (Dolj), Valea Lupului (Iași), Giroc (Timiș), Râmetea (Alba) and Cluj-Napoca (Cluj).

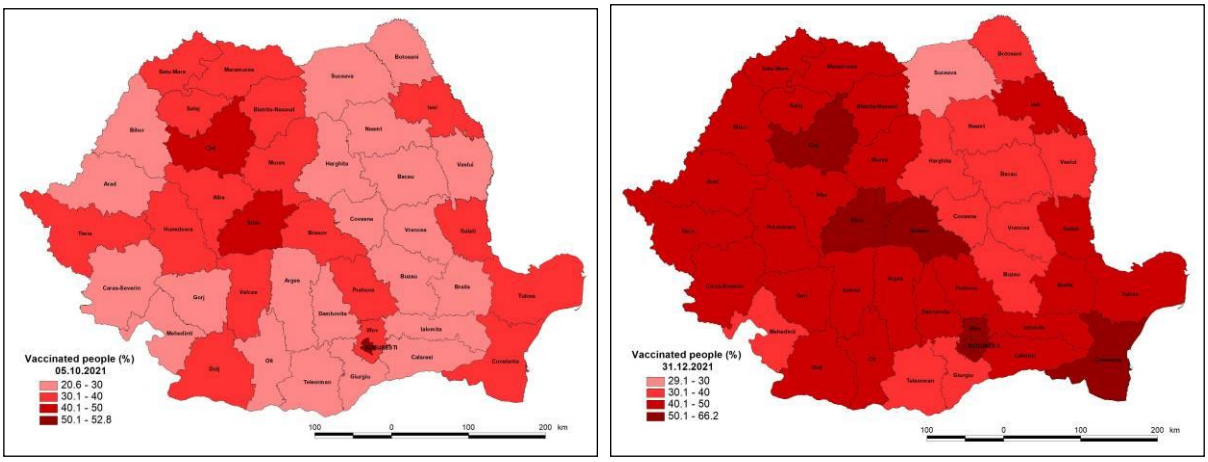

Fig. 7 – The percentage of vaccinated people by county (5.10.2021; 31.12.2021).
Source: https://vaccinare-COVID.gov.ro/situatia-vaccinarii-in-romania/.

The town with the lowest vaccination rate is Bărbulești in Ialomița County – 0.4%. Five other settlements had a vaccination rate below 3%: Ulma (Suceava), Slobozia Bradului (Vrancea), Dobromir (Constanța), Valea Moldovei (Suceava) and Jina (Sibiu).

In November 2021, the highest vaccination rate, over 50%, was registered for the category of people aged 50–59, followed by those aged 60–69 – 49%. The lowest percentage of vaccination was registered among people aged over 80 and children aged 12–15. Except for these two age groups, the other groups got close to 50%.

On December 16, 2021, 40.7% of the general population was vaccinated, 46.5% of the eligible population over 12 years old, and 48.8% of the adult population, over 18 years old. On January 5, 2022, the percentage of the vaccinated population in the two areas of residence was as follows: rural environment – 36.77%; urban environment – 41.26%, and municipalities – 43.05% (https://vaccinare-COVID.gov.ro/situatia-vaccinarii-in-romania/).

At the level of administrative units, the highest vaccination coverage rates, over 60%, were in Salva (Bistriţa-Năsăud County) and Dumbrăvița (Timiș County). Twenty-six localities (0.8% of the total number) registered values between 50.5% and 59.4% vaccinated population. Twelve localities

(0.4%) have a vaccination rate below 6%. The localities of Bărbulești (Ialomița County) and Costache Negri (Galați County) register the minimum value of vaccination – 1% (Fig. 8). For the other localities, the situation is as follows: 61 localities (1.9% of the total number) registered between 6–10% vaccination rate, 761 localities (23.9%) – between 10.1–20%, 1,336 localities (42%) – between 20.1–30%, 770 localities (24.2%) – between 30.1–40%, and 214 localities (6.7%) – between 40.1–50%.

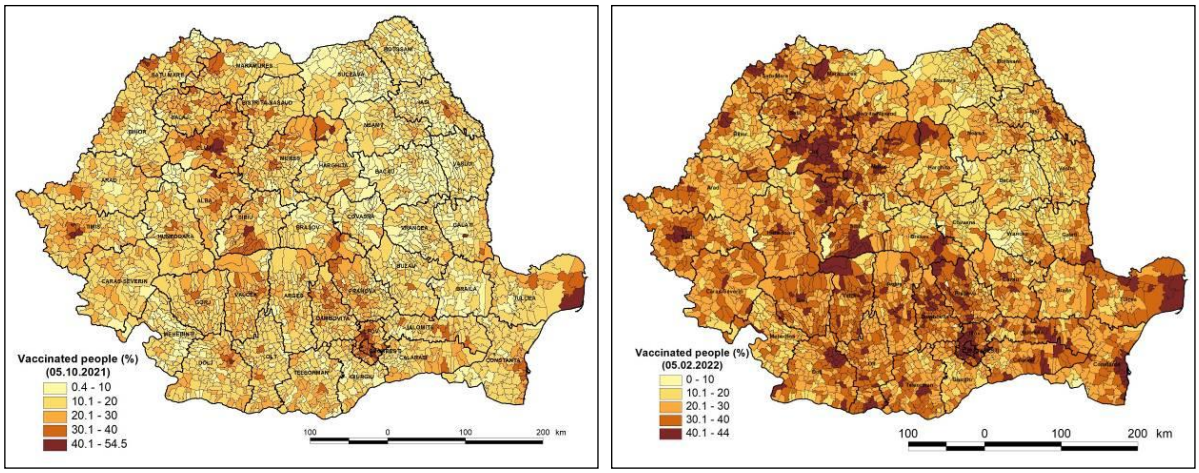

Fig. 8 – The percentage of vaccinated people by locality (5.10.2021; 5.02.2022).
Source: https://vaccinare-COVID.gov.ro/situatia-vaccinarii-in-romania/.

Between March 2020 and March 8, 2022 (when the state of alert ended) there were five pandemic waves in Romania:

- The first wave (February – September 2020) registered a maximum of infections on August 27 – 1,504 COVID-positive people;
- The second wave (October 2020 – February 2021) with a maximum number of 10,269 active cases registered on November 18, 2020;
- The third wave – the Alpha variant (March – August 2021) – the maximum number of daily cases registered was 6,651 on March 25, 2021);
- The fourth wave – the Delta variant (September – November 2021) – registered a maximum value on October 19 – 18,863.
- The fifth wave – the Omicron variant (December 2021 – February 2022) – on February 1, 2022, the maximum number of infections, 40,018, was recorded.

In the first year of the pandemic, a total of 632,263 cases of people infected with the new coronavirus (COVID-19) were confirmed, with 15,767 deaths. Until December 31, 2021, 1,808,891 cases of infection were registered, 11,341 of which were reinfected patients. The number of people who died in 2021 was 42,985. The total number of those who died after contracting SARS-Cov-2 reached 64,094 on March 8, 2022.

In late 2021 and early 2022 Europe was in full wave five. The authorities in Romania were preparing for this wave of the pandemic, there being a fairly high probability that the Omicron variant of the coronavirus would become dominant among the population. The fifth wave saw the peak of infections in late January and early February. The percentage of the fully vaccinated population was 40.1% of the total eligible population.

3.6. The evolution of the mortality rate

The main demographic impact has to do with the mortality rate, with deaths causing changes in the population structure and having socio-economic effects. The population's consumerist behaviour changed, the imposition of home isolation and social distancing as a measure against the spread of the virus affected mainly the young population, the pressure on the healthcare system increased, mortality was high among the over-60 population, as well as among those suffering from comorbidities.

The total number of deaths between January and November 2019 was 237,288. Most were caused by circulatory system diseases – 132,536 people. Next came those caused by tumours – 46,121 people, respiratory system diseases – 16,176, and digestive system diseases – 14,266.

Between January and November 2020, there was an increase in the total number of deaths, reaching 260,595, the maximum number of deaths being caused by circulatory system diseases, as in the previous year (Fig. 9). Next came those caused by tumours – 45,547 people, and respiratory system diseases (including COVID) – 30,373.

In 2021, between the months of January and November, there was an increase in the number of deaths, up to 307,192 people, 46,597 more than in 2020 during the same period and 69,000 more than in 2020 overall. In 2019, the highest number of deaths was recorded in January – 27,388 and March – 23,665; in 2020 the highest values were registered in October – 27,491 and November – 34,769, in 2021 the maximum values were recorded in the same months – 44,595 and 38,653, respectively.

In 2020, the total number of deaths was 297,345. By the main causes of death, the situation was as follows: circulatory system diseases – 162,780 people (54.7% of the total no. of deaths), tumours – 49,769 (16.7%), respiratory system diseases, including COVID – 38,578 (13%), digestive system diseases – 15,318 (5.2%), and other causes of death – 30,894 people (10.4%) (Fig. 10).

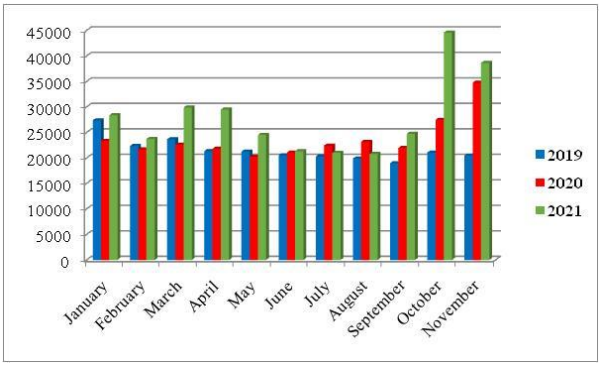

Fig. 9 – Deaths (total no. of people, 2019–2021).

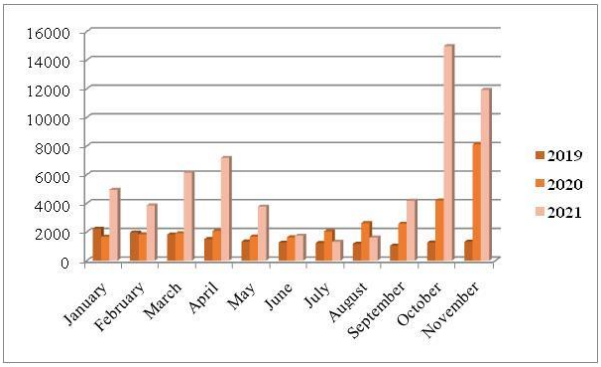

Fig. 10 – Deaths (respiratory system diseases – no. of people, 2019–2021).

Source: https://insse.ro/cms/sites/default/files/com_presa/anexa_date/cauze_deces.xlsx.

In Romania, the highest number of deaths since the start of the pandemic was recorded in October 2021 – 44,595 people, 2.9 times higher than the number of live births. At the other end of the spectrum was the month of August, with 20,788 deaths. The number of deaths recorded in October 2021 was 19,858 more than in September 2021. The number of people who died in October 2021 was 1.6 times higher than in October 2020. In October 2021, over two-thirds of the total number of deaths was recorded for people aged 70 and over. Conversely, the lowest number of deaths was recorded for the age groups 5–19 years (71 deaths), 0–4 years (119) and 20–29 years (141).

In terms of cause of death, most people died from circulatory system diseases – 159,153 people (51.8% of the total number of deaths registered between January and November 2021), respiratory system diseases, including COVID – 61,662 people (20.1%), tumours – 42,721 deaths (13.9%),

digestive system diseases – 14,251 deaths (4.6%), other diseases – 39,405 deaths (9.6%). The maximum number of deaths was recorded in October 2021 for all death categories. After four months when respiratory system diseases were the third-leading cause of death, in the months of September and October 2021 respiratory system diseases were, once more, the second main cause of death, a situation also recorded between October 2020 and April 2021 (Figs. 11, 12, 13).

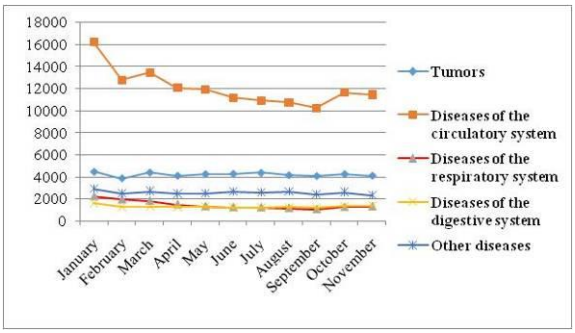

Fig. 11 – Deaths by main cause of death (2019).

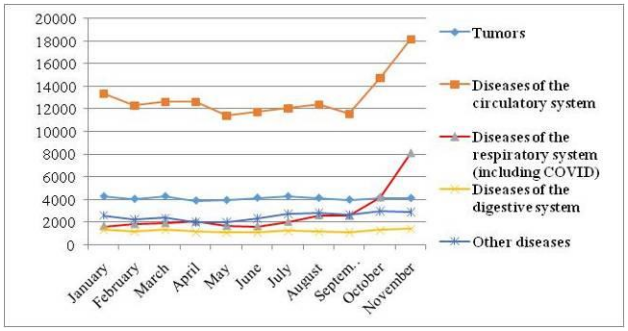

Fig. 12 – Deaths by main cause of death (2020).

Source: https://insse.ro/cms/sites/default/files/com_presa/anexa_date/cauze_deces.xlsx.

In 2020, the overall mortality rate was 297,345 deaths. In terms of living environment, 50.3% of deaths were recorded in rural areas and 49.7% in urban areas. In terms of sex, the number of deaths among the male population recorded higher values – 158,506 deaths, compared to that among the female population – 138,839 (Table 3).

In 2021 the overall mortality rate was 307,192 deaths. In terms of living environment, there was the same percentage of deaths recorded as in the previously analysed year. In terms of sex, the number of deaths among the male population recorded higher values – 52.1% of the total population.

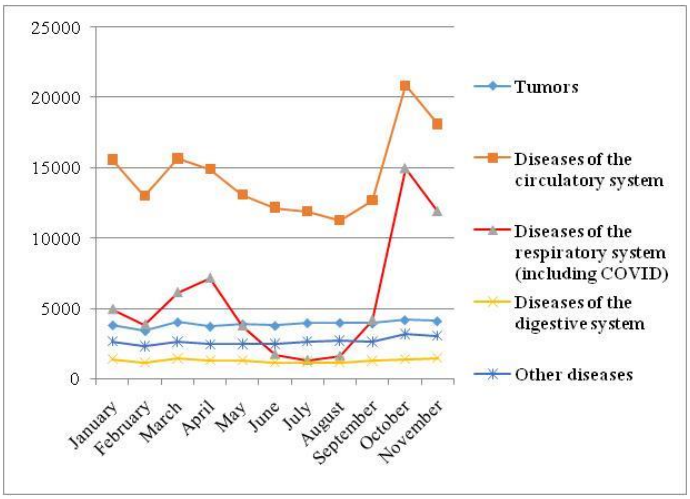

Fig. 13 – Deaths by main cause of death (2021).

Source: https://insse.ro/cms/sites/default/files/com_presa/anexa_date/cauze_deces.xlsx.

Table 3

Mortality by environment residence

Living environment	January	February	March	April	May	June	July	August	September	October	November	December
A	1	2	3	4	5	6	7	8	9	10	11	12
2020[1)]												
Urban	**11,531**	**10,745**	**11,156**	**10,733**	**10,382**	**10,259**	**11,243**	**11,751**	**10,921**	**13,973**	**17,755**	**17,435**
Male	6,010	5,610	5,882	5,691	5,479	5,399	5,973	6,305	5,861	7,564	9,628	9,483
Female	5,521	5,135	5,274	5,042	4,903	4,860	5,270	5,446	5,060	6,409	8,127	7,952
Rural	**12,529**	**11,406**	**11,689**	**11,166**	**10,589**	**10,744**	**11,163**	**11,522**	**10,813**	**13,581**	**17,197**	**17,062**
Male	6,636	6,069	6,096	5,886	5,616	5,772	5,958	6,241	5,847	7,270	9,236	8,994
Female	5,893	5,337	5,593	5,280	4,973	4,972	5,205	5,281	4,966	6,311	7,961	8,068
2021[2)]												
Urban	**13,970**	**11,805**	**15,349**	**15,256**	**12,275**	**10,567**	**10,591**	**10,512**	**12,424**	**22,588**	**19,128**	13,285
Male	7,544	6,191	8,136	8,119	6,441	5,527	5,505	5,523	6,496	11,486	9,525	6,873
Female	6,426	5,614	7,213	7,137	5,834	5,040	5,086	4,989	5,928	11,102	9,603	6,412
Rural	**14,420**	**11,915**	**14,550**	**14,262**	**12,252**	**10,770**	**10,437**	**10,276**	**12,313**	**22,007**	**19,525**	14,355
Male	7,674	6,307	7,684	7,454	6,423	5,630	5,500	5,383	6,425	11,231	9,958	7,425
Female	6,746	5,608	6,866	6,808	5,829	5,140	4,937	4,893	5,888	10,776	9,567	6,930

Source: https://insse.ro/cms/ro/tags/comunicat-miscarea-naturala-populatiei.

COVID-19 mortality by county

The number of deaths caused by COVID-19 increased continuously: from two at the beginning of the pandemic to 15,767 deaths on December 31, 2020. At the end of 2021 there was an excess in the number of COVID-19 deaths of 42,985 compared to the previous year; on March 8, 2022, the number of those who died reached 64,156.

Starting May 2021, following various checks that had been carried out, a request was made by the Public Health Directorates in the country of the Ministry of Health, and deaths caused by the COVID-19 infection, from the previous period, were entered into the database.

On June 24, 2021, the number of people who died from COVID-19 was 31,985. The lowest values were registered in Giurgiu, Teleorman and Tulcea counties. Figures between 1,058 and 1,558 deaths were registered in the counties of Maramureș, Sibiu, Argeș, Brașov, Suceava, Constanța, Timiș, Prahova and Bihor. The maximum number of deaths – 2,467 – was recorded in Bucharest.

On July 15, 2021, the death toll rose to 33,393 people, an increase of 1,408. The lowest values were recorded also in the three previously mentioned counties (under 300 deaths in each county) (Fig. 14). Bacău county was added to the list of counties with over 1,000 deaths and over, registering 1,000 deaths.

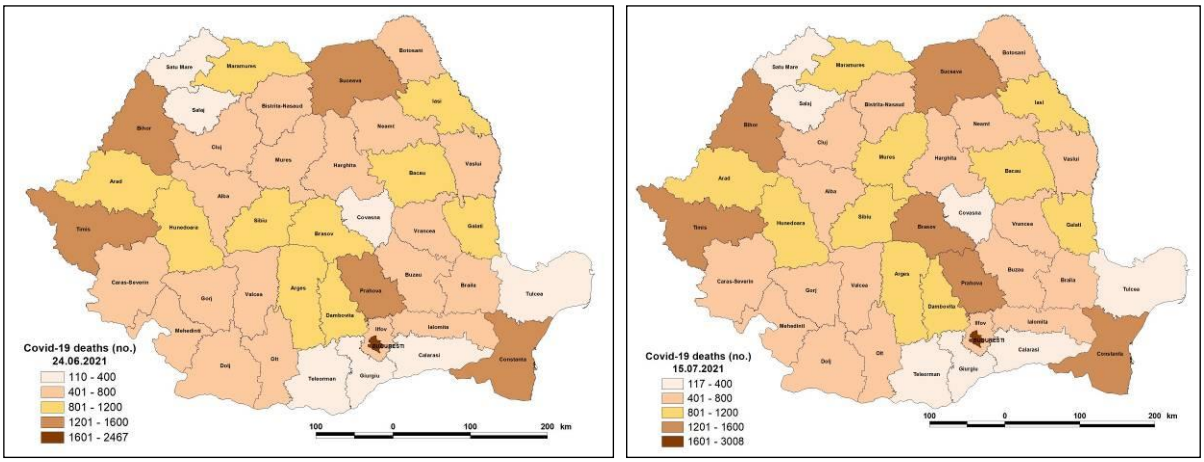

Fig. 14 – The number of people who succumbed to COVID-19 (24.06.2021; 15.07.2021).
Source: https://www.mai.gov.ro/informare-COVID-19-grupul-de-comunicare-strategica.

On November 15, 2021, the number of people who passed away was 51,686, an increase of 18,293 deaths compared to the previously analysed period. There was no county that registered fewer than 300 deaths. The minimum values, under 500 deaths, were in the counties of Giurgiu, Tulcea and Covasna. Twenty-three counties registered over 1,000 deaths (54.8% of the total number), the highest values being recorded in Bihor, Prahova and Bucharest. The following counties joined the previously mentioned counties with over 1,000 deaths: Alba, Caraș-Severin, Hunedoara, Botoșani, Vaslui, Dolj, Neamț, Dâmbovița, Mureș, Arad, Iaşi, and Galați.

As of January 5, 2022, the number of deaths was 57,663, an increase of 5,997 deaths compared to the previously analysed period. The number of deceased increased, so that at that time there was no county with fewer than 400 deaths. The minimum values were registered in the counties of Giurgiu, Tulcea and Covasna (Fig. 15). The number of counties with over 1,000 deaths increased to 25 (60% of the total number), the highest values being recorded in Bihor, Prahova and Bucharest. The following counties joined the previously mentioned counties with over 1,000 deaths: Bistrița-Năsăud and Cluj. On March 8, 2022, the number of people who died as a result of the coronavirus infection reached 64,156.

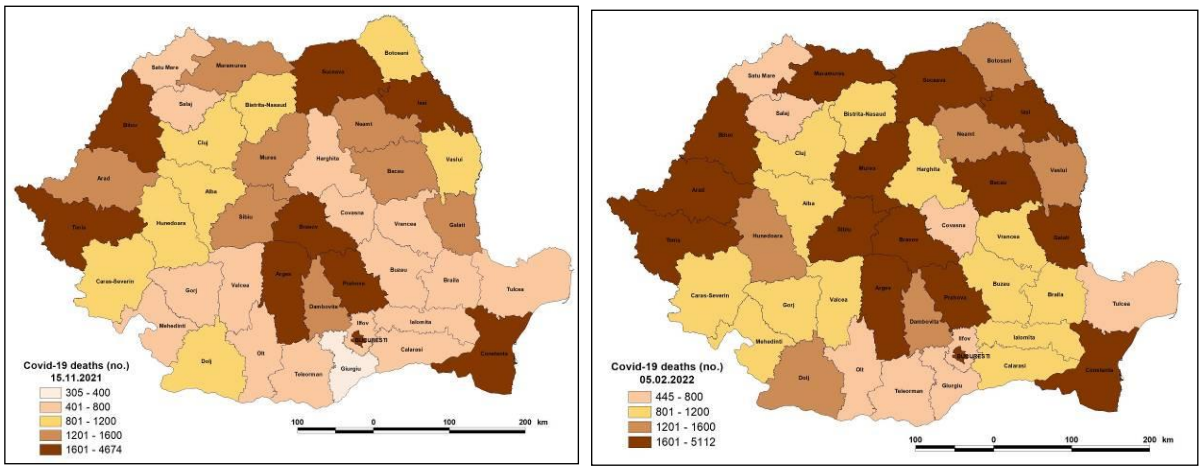

Fig. 15 – The number of people who succumbed to COVID-19 (15.11.2021; 5.01.2022).
Source: https://www.mai.gov.ro/informare-COVID-19-grupul-de-comunicare-strategica.

4. CONCLUSIONS

The socio-economic impact of the COVID-19 pandemic had medium and long-term effects: the suspension of employment contracts during the state of emergency, especially in the accommodation, trade or construction fields, people with a low level of education were exposed to the risk of losing their jobs because they performed a seasonal activity or did not have a registered employment contract, the economic crisis, a high unemployment rate, the limited access of the population to health units and medical services, which led to the deterioration of the health of the chronically ill, restrictions were imposed on the movement of people, triggering an economic decline in the field of public and private transport, the long-term transition to online classes, with some of the students' health being affected by the lack of in-person activities, some children coming from financially-struggling families not having access to online classes, an increase in domestic violence cases.

The main demographic impact was related to the increase in the mortality rate, as the number of deaths triggered changes in the population structure, ultimately having socio-economic effects. The pressure on the medical system increased and remote medical services came into effect.

Concerns existed and measures were taken to maintain a decent standard of living: the introduction of state-paid technical unemployment, the postponement of utility services payments, the

postponement of payments for social contributions and taxes, companies switching to work-from-home and investing in the digitization of services, which offered employees greater freedoms, such as flexible working hours, while also requiring them learning new skills. The COVID-19 pandemic has accelerated the digital transition, as harnessing it is an essential part of improving the quality of life and establishing a solid economic base.

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TRAVEL HABITS AND CHANGES CAUSED BY THE COVID-19 PANDEMIC IN BOSNIA AND HERZEGOVINA

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Key-words: tourism, COVID-19 pandemic, tourist habits, socio-demographic factors, tourist trips.

Abstract. In the past ten years, there has been significant growth in tourism worldwide, including in Bosnia and Herzegovina. The tourism sector is facing a series of challenges and limitations in the general business environment due to the COVID-19 pandemic, as is the entire global economy. The current pandemic has slowed down the growth of world tourism and thus led to the poorer performance of private tourism subjects and an increase in unemployment in the sector. This study aims to analyse the habits of the inhabitants of Bosnia and Herzegovina and the changes in behaviour caused by the COVID-19 pandemic. The two main questions entertained are: whether socio-demographic variables influenced the intention to travel during the COVID-19 pandemic, and whether tourist travel habits influenced the intention to travel during the COVID-19 pandemic. The study uses a quantitative research approach that included data collection through an online survey. The questionnaire link was distributed electronically, via Facebook (social network), and e-mail. The population included in this research are the inhabitants of Bosnia and Herzegovina. The convenience sample included 265 respondents and the research was conducted for one and a half months (from March 2, 2022 to May 17, 2022). The results of the research show that socio-demographic factors influenced the intention to travel during the COVID-19 pandemic and that respondents who own a car would travel more in 2022 than respondents who do not own a car; that respondents aged 31–50 would travel more in 2022 than the older respondents, that respondents who are employed would travel more in 2022 than pensioners, that respondents living in a household of 1–2 members would travel more in 2022 than respondents living in a household of 5 or more members, that respondents with postgraduate studies would travel more in 2022 than respondents with elementary studies only and that respondents with a monthly income of over 2,500 BAM would travel more in 2022 than respondents with monthly income between 500 to 1,500 BAM. The results also show that those respondents who travelled frequently before the COVID-19 pandemic would travel less in 2022 in the context of the current situation of the COVID-19 pandemic.

1. INTRODUCTION

Tourism represents one of the fastest growing economic activities, which significantly affects the growth and development of the global economy. In the past ten years, there has been significant growth in tourism worldwide, including in Bosnia and Herzegovina. Tourism as an economic branch with a significant potential for development is an increasingly frequent topic of the competent institutions in Bosnia and Herzegovina. The fact is that in the period before the outbreak of the COVID-19 pandemic, tourism recorded constant growth year after year, and such a trend was justifiably predicted and continued. Tourism activity in Bosnia and Herzegovina has seen a significant increase in the number of tourist arrivals and overnight stays in recent years. In 2019, the number of tourist arrivals reached 1,641,000, which is a growth of 25.6% compared to 2017. The number of overnight stays by tourists was 3,371,000, which is an increase of 25.9%. This growth is the result of a higher number of foreign tourist arrivals, which increased by almost 30%, i.e., by 26.4% in the case of overnight stays by foreign tourists. The number of arrivals and overnight stays of domestic tourists was lower, but still high. In the 2017–2019 period, the increase in the number of arrivals was 15.4%, and in overnight stays was 24.6% (Ekonsultacije, 2021). When it comes to the year 2020, specifically the January–July period, according to the official data, tourists made 257,256 visits, which is 71.7%

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fewer, and 635,172 overnight stays, which is 66.2% fewer compared to the same period in 2019. The number of overnight stays by domestic tourists is lower by 40.5%, while the number of overnight stays by foreign tourists is lower by 76.5% compared to the same period in 2019 (Aljazeera, 2020).

In addition to the significant impact on the economy, tourism is extremely sensitive to various types of risks. Crisis situations have a negative impact on the development of tourism, and this impact has been significantly intensified since the 2000s, when numerous crises occurred, such as natural disasters, terrorist attacks, epidemics etc. (Abdullah *et al.*, 2020; Butu *et al.*, 2020; Fenichel *et al.*, 2013; Jones & Salathe, 2009).

In the period before the pandemic, tourism was the fastest-growing economic branch in the world. The tourism sector, as well as the entire global economy, is now facing a series of challenges and limitations in the general business environment due to the COVID-19 pandemic (Abdullah *et al.*, 2020; Butu *et al.*, 2020; Čaušević, 2023; Fotiadis *et al.*, 2021; Gössling, 2021). This pandemic has caused a global crisis, which, in turn, has affected the economy and society in general, especially the service industry, which also includes tourism. The onset of the COVID-19 pandemic at the beginning of 2020 left its mark on the economy of countries all over the world. The pandemic has slowed down the growth of world tourism and thus led to a poorer performance of private tourism entities and an increase in unemployment in the sector. One of the key measures to solve this pandemic included the introduction of a travel ban, which had the effect of reducing the number of tourist trips. Based on this, it is possible to conclude that tourism is one of the economic branches that suffered the most damage and that the COVID-19 pandemic had the greatest impact on this activity. This is evident through the drop in income, suspension of flights, restriction of movement, and so on. It is a massive, dynamic, and complex socio-economic phenomenon of the modern era, which includes a wide spectrum of relationships that reflect on the economic, ecological, and social aspects of life.

Pandemics are not exactly a new phenomenon that is strictly related to modern societies, since they did exist in the past (Butu *et al.*, 2020). Among previous epidemics is the H5N1 bird flu epidemic (commonly known as bird flu), which has received worldwide attention since 2004, and was initially detected in East and Southeast Asia, only to later spread worldwide (Chan & Baum, 2007). The COVID-19 pandemic is considered the most important global health disaster of the century and the most significant challenge humanity has faced since World War II (Chakraborty & Maity, 2020). The closest parallel to the situation we are in could be the Spanish flu of 1918 when, according to estimates, about 27% of people became infected and about 1.7% of the world's population became sick (Mirzaei, Sadin & Pedram, 2021).

The COVID-19 pandemic at the beginning of 2020 shocked the global community and surprised the professional and scientific public, but answers arrived very quickly in the field of tourism and related studies (Vojnović, 2021). The fear of the COVID-19 virus has led to significant uncertainty and chaos in many industries. Tourism has experienced a sharp decline in income and has become one of the economic sectors most seriously affected by the pandemic. The shock affected both the demand side (restrictions on freedom of movement, border closures, tourists' fear of infection) and the supply side (closure of accommodation and catering facilities, as well as leisure facilities used in tourism) (Ugur & Akbiyik, 2020).

Different scientific aspects of the vision of travel and tourism after the global transformation of the COVID-19 disease in 2020 were investigated (Lew *et al.*, 2020). Many researchers have individually dealt with the impact of the coronavirus pandemic on travel and tourism. Hussain *et al.* (2021) established, on the eve of the third wave of the pandemic, that a new tourist era had begun, that they are more cautious, conservative, and limited. Consequently, there began the reshaping of tourism products, experiences, and significant investments. Hartman (2021) proposes areas of adaptive tourism associated with complex adaptive systems (CAS) as a means of survival in the context of changing circumstances, such as overtourism, COVID-19 disease, climate change, economic crises, and other factors. By applying two different methodologies, Fotiadis *et al.* (2021) indicate that the drop in tourist arrivals can range between 30.8% and 76.3% with a duration of at least until June 2021. Gössling *et al.* (2021) compared the effects of

the COVID-19 disease with previous epidemics and pandemics and other types of global crises in the period between 2000 and 2015. They found that international tourism was exposed to a wide range of crises in the past, such as terrorist attacks, the outbreak of the severe acute respiratory syndrome (SARS) (2003), the global economic crisis of 2008/2009, and the Middle East Respiratory Syndrome (MERS) outbreaks. None of these led to a long-term decline in global tourism development. They concluded that tourism as a system, at least in the observed period, was resistant to external shocks, while the impact of the coronavirus is unprecedented. Zheng *et al.* (2021) conducted research in China in 2020 to establish what drives the pandemic of travel fear and how people enact self-protection, pandemic coping, and travel-related resilience. The results showed that threat severity and sensitivity can cause fear of travel, leading to protective motivation and travel behaviour after a pandemic outbreak. The results also revealed that the fear of travel can trigger different coping strategies, which increases people's psychological resilience and the adoption of cautious tourist behaviour (Vojnović, 2021).

Fear of infection and perceived risk also significantly influence travel behaviour, especially in transit, and the impact was different based on the infected area and people's demographic characteristics (Kim *et al.*, 2017; Cahyanto *et al.*, 2016). Several previous studies have highlighted that individuals tend to cancel or delay international travel or flights to avoid infection during a pandemic. Such self-protective behaviour mainly depends on demographic characteristics (age and race in particular) and the perceived risk of infection (Fenichel *et al.*, 2013; Sharangpani *et al.*, 2011). In particular, several studies reported that older travellers were more willing to postpone their trips compared to young travellers (18–35 years) during the H1N1 outbreak (Leggat *et al.*, 2010; Sharangpani *et al.*, 2011). The results of an online survey conducted by Jones & Salathe (2009) during the beginning of the swine flu outbreak explained that older age was associated with more avoidant behaviours including avoiding large gatherings and public transportation.

All these previous studies point out that behaviour during travel during a pandemic situation could be significantly different compared to everyday life. Many factors (socio-demographic, as well as attitudinal) influence such changes in behaviour and travel patterns. Previous studies have analysed COVID-19 and tourism in destination countries, but only a few studies have analysed the behaviours of the countries from which travellers travel (Čaušević, 2023; Hotle & Mumbower, 2021; Matsuura & Saito, 2022). For this reason, it is important to investigate changes in behaviour and travel patterns caused by the COVID-19 epidemic, i.e., whether socio-demographic factors have an impact on travel intention during the COVID-19 pandemic and whether tourist travel habits have an impact on travel intention during the COVID-19 pandemic. So far, no study has answered these questions. Therefore, the primary aim of this study is to fill the gap by analysing the socio-demographic characteristics of the inhabitants of Bosnia and Herzegovina, their habits, and travel patterns.

2. STUDY AREA

Bosnia and Herzegovina is a country in Southeast Europe, located in the western part of the Balkan peninsula (Fig. 1). Bosnia and Herzegovina stretches over an area of 51,129 square kilometres. It is surrounded by three countries – the Republic of Croatia to the North, West and South, the Republic of Serbia to the East, and the Republic of Montenegro to the Southeast. Its borders generally follow certain natural features, and for the most of its extent have an orographic and hydrographic character. Bosnia and Herzegovina also has one of the shortest coastlines in the world. In the sector of the Bay of Neum and the Klek peninsula in the Bay of Mali Ston, it reaches the Adriatic Sea, with a coastal façade of 24 kilometres in length. The characteristic shape of the national territory on a geographic map is frequently associated with a right triangle with even legs, whose hypotenuse has a northwest-southeast direction. This motif is also used on the national flag (Department of Geography, 2023).

With an average altitude of 625 meters, Bosnia and Herzegovina ranks among the hypsometrically higher countries in Europe. Its terrain is predominantly mountainous, but at the same time it is very broken into valleys. The entire morphostructure of this area belongs to the Dinaric Mountain System, which extends on the northwest-southeast direction through several countries. In a wider context, the Dinaric mountains are part of the Mediterranean zone of the Alpide belt, which is still quite tectonically active, in seismic terms. The mountain peaks of the Dinaric system are the highest in its southeastern sector (Department of Geography, 2023).

Considering the official results of the 2013 census, it can be said that Bosnia and Herzegovina has about 3.5 million inhabitants. It is evident that war events have left catastrophic scars on the demographic image of this country, since there is a decrease of almost a million inhabitants compared to 1991. Although Bosnia and Herzegovina traditionally used to be an emigration area all throughout history, it recorded a very intense population growth during the 20th century, only to reach a record 4.4 million inhabitants in 1991. The impact of demographic transition was also visible, since this growth had been slowing down even before the war. The last phase of demographic transition took place together with war events, and in recent years, a negative natural increase has been recorded, together with the aging of the population. The average population density is under 70 inhabitants/km². When it comes to the population structure, for political reasons, most attention is paid to the ethnic composition, dominated by three constituent ethnic groups: Bosniaks (50.1%), Serbs (30.8%) and Croats (15.4%). The settlement structure of Bosnia and Herzegovina consists of about 6,000 inhabited places, 105 of which are classified as urban (cities and towns). Regarding the size of the rural population (58%), Bosnia and Herzegovina ranks at the very top of the list of the most rural European countries (Department of Geography, 2023).

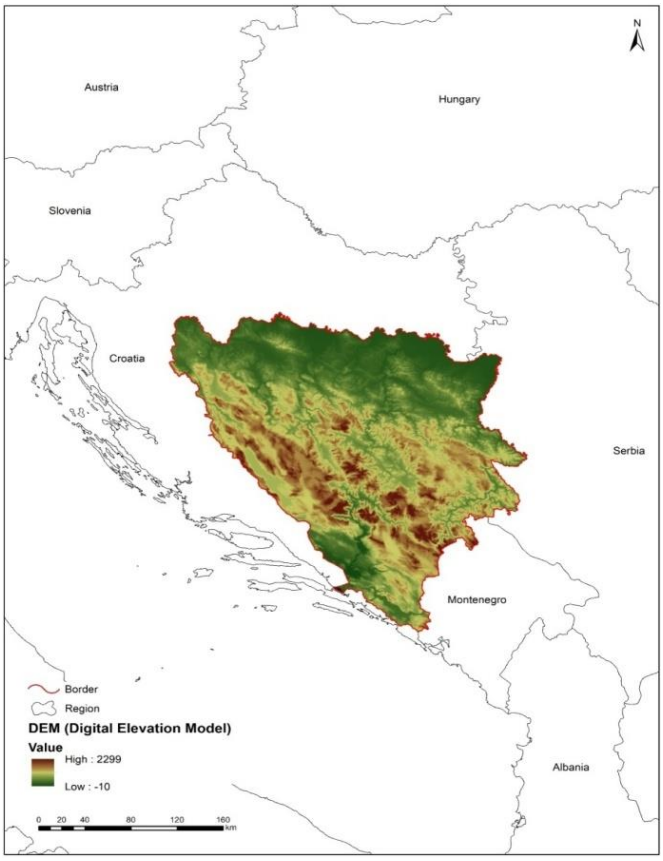

Fig. 1 – Geographical position of Bosnia and Herzegovina.

Tourism, as an increasingly important branch of the tertiary sector of the economy, has great development potential in Bosnia and Herzegovina, based on a significant number of unique destinations, both in terms of natural and cultural-historical heritage. Among the urban centres that are characterized by specific historical development visible in their architecture and other tourism contents, Sarajevo and Mostar stand out in particular, but so do Bihać, Banja Luka, Jajce, Travnik, Višegrad and some other towns that are also home to many historical buildings and sites. According to the number of foreign visitors, religious tourism is at the very top of the tourism offer. As Bosnia and Herzegovina is famous for its multireligious character, this tourism branch is based on a large number of sacred objects (mosques, churches, monasteries, synagogues) bearing a great cultural and historical value. Medjugorje is by far the most visited destination of this type, because it is one of the most famous Marian shrines in the world. The Sarajevo Film Festival is one of the most famous examples of manifestation tourism in the country. Bathing tourism is developing in Neum (the only coastal town), and on numerous lakes and rivers in the interior. A large number of spas point to a great potential for this type of tourism and, so far, the best valorised are Reumal Spa in Fojnica and Vrućica Spa near Teslić. As to mountain landscapes, there are several types of tourism, and the most significant destinations are Jahorina, Bjelašnica, Vlašić and Kupres. When capitalising on the natural environment for tourism purposes it is necessary to ensure its preservation, because it is the largest resource that this country has. There are a number of protected areas within the territory of Bosnia and Herzegovina, but only four are classified as national parks – Sutjeska, Kozara, Una and Drina (Department of Geography, 2023).

Tourism was the fastest growing sector in Bosnia and Herzegovina until the onset of the COVID-19 pandemic. The first case of the spread of the coronavirus pandemic in Bosnia and Herzegovina was recorded in March 2020. To control the spread of the virus, the government of Bosnia and Herzegovina has imposed and recommended preventive measures and different controls depending on the local administration and socioeconomic conditions. Such strategies included closing schools, remote or online classes, closing shops and restaurants, working from home, restrictions on public gatherings, social events, and meetings, locking down cities, closing international borders and airports, imposing curfews and social distancing, the suspension of public transportation and taxi operations, as well as travel restrictions (Čaušević, 2023). The COVID-19 pandemic has stopped the positive trend of tourism growth in Bosnia and Herzegovina. The consequences of the pandemic are substantial, but already in 2021, a significant recovery was noticeable. In 2020, tourists in Bosnia and Herzegovina made 500,916 visits, which is 69% less to 2019, and 1,240,983 overnight stays, which is 63% less compared to the same year. In 2022, a total of 1,464,216 arrivals were registered (907,526 foreign and 556,690 domestic), which is 11% less than the record year 2019 (the Agency for Statistics of Bosnia and Herzegovina, 2023). The mentioned data shows that the tourism sector in Bosnia and Herzegovina has already significantly recovered from the consequences of the COVID-19 pandemic.

3. METHODOLOGY

The purpose of the study is to analyse the habits of the inhabitants of Bosnia and Herzegovina and the changes in behaviour caused by the COVID-19 pandemic. The two main questions asked in the research are: do socio-demographic variables influence the intention to travel during the COVID-19 pandemic, and do tourist travel habits influence the intention to travel during the COVID-19 pandemic?

The study used a quantitative research approach that included data collection through an online survey. The questionnaire was created using Google Forms in the Bosnian language since the respondents are residents of Bosnia and Herzegovina. The questionnaire contained questions about the demographic structure of the respondents, how often the respondents travelled before the pandemic, and to what extent they intend to travel in 2022. The questionnaire link was distributed electronically,

via Facebook (social network) and e-mail. The population included in this research are the inhabitants of Bosnia and Herzegovina. The convenience sample included 265 respondents, and the research was conducted over a month and a half (from March 2nd, 2022 to May 17th, 2022). Respondents from the sample were selected randomly.

In the study, descriptive statistics and tests of statistical significance were used in the interpretation and analysis of the obtained data. The analysis of the obtained data was performed using the IBM SPSS Statistics 26.0 statistical program, which is the world's leading statistical software used to solve research problems by means of ad-hoc analysis, hypothesis testing, and predictive analytics. Statistical tests are selected according to the type of data processed as part of the analysis. Descriptive statistics were used to describe the research results by variables and as a basis for statistical tests. Nonparametric tests were mainly used in this study for inferential statistical analyses. Among the nonparametric tests, the Mann-Whitney and Kruskal-Wallis tests were used. Spearman's rank correlation coefficient was also used to examine the correlation between travel habits and personal travel expectations variables in 2022, during COVID-19.

4. RESULTS

Table 1 tests the normality of the distribution for the following variable: "To what extent will you be traveling in 2022 in the context of the current situation regarding the COVID-19 pandemic".

Since the Kolmogorov-Smirnov test concerning the normality of the distribution for the variable "How much will you travel in 2022 in the context of the current situation regarding the COVID-19 pandemic?" (at the significance level of 0.01) deviates from the normal distribution, the non-parametric Man-Whitney and Kruskal-Wallis tests were used to test the difference in the arithmetic mean concerning socio-demographic factors.

Table 1

Testing the normality of the distribution for the travel intention variable in 2022 in the context of the current situation regarding the COVID-19 pandemic

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
To what extent will you be traveling in 2022 in the context of the current situation regarding the COVID-19 pandemic?	.218	265	.000	.877	265	.000

Lilliefors Significance Correction

Source: Research results, 2022.

The non-parametric Mann-Whitney test shows that owning a car is a statistically significant factor ($z = -2.836$, $p < 0.01$) that influences the extent to which respondents will travel in 2022 in the context of the current situation regarding the COVID-19 pandemic, so the respondents who own a car ($M = 141.27$) believe that they will travel more in 2022 than those who do not ($M = 113.18$).

Table 2

Group statistics of the influence of socio-demographic factors on the intention to travel in 2022 in the context of the current situation regarding the COVID-19 pandemic

To what extent will you be traveling in 2022 in the context of the current situation regarding the COVID-19 pandemic? Group		Mean Rank	Mann-Whitney Kruskal-Wallis [b]	z	p
Sex	male	130.52	7803.500 [a]	-.408	.683
	female	134.37			
Age	18 – 30 years	130.32	14.304 [b]		001
	31–50 years	152.60			
	over 50 years	98.06			

(continued)

Education	Elementary School	20.00	8.184 [b]		.042
	High school	133.54			
	Associate degree or college	125.80			
	Postgraduate education	157.18			
Employment	Student	125.30	17.147 [b]		.001
	Employed	148.20			
	Pensioner	76.65			
	Others	120.21			
Monthly household income (BAM)	Less than 500 BAM	118.66	7.907 [b]		.048
	500 BAM – 1,500 BAM	117.40			
	1,500 BAM – 2,500 BAM	142.89			
	More than 2,500 BAM	144.11			
Number of people in the household	1–2	141.74	8.281 [b]		.016
	3–4	134.28			
	5 and more	92.33			
Owning a car	YES	141.27	5747.000 [a]	-2.836	.005
	NOT	113.18			
Owning a motorcycle	YES	140.38	1982.500 [a]	-.428	.669
	NOT	132.49			

Source: Research results, 2022.

The non-parametric Kruskal-Wallis test from Table 2 shows that:

- Statistically, respondents aged 31–50 (M = 152.60) significantly ($p < 0.01$) believe that they will travel more in 2022 than the older respondents (M = 98.06),
- Statistically, respondents who are employed (M = 148.20) significantly ($p < 0.01$) believe that they will travel more in 2022 than pensioners (M = 76.65),
- Statistically, respondents who live in a household of 1–2 members (M = 141.74) significantly ($p < 0.05$) believe that they will travel more in 2022 than respondents who live in a household of 5 or more members (M = 92.33),
- Statistically, respondents who have a postgraduate education (M = 157.18) significantly ($p < 0.05$) think that they will travel more in 2022 than respondents who have an elementary education only (M = 20.00),
- Statistically, respondents with a monthly income of over 2,500 BAM (M = 144.11) significantly ($p < 0.05$) believe that they will travel more in 2022 than respondents with a monthly income between 500 and 1,500 BAM (M = 117.40).

Table 3

The correlation between travel habits and personal travel expectations variables in 2022 during COVID-19

			How often did you travel before the COVID-19 pandemic?	To what extent will you be traveling in 2022 in the context of the current situation regarding the COVID-19 pandemic?
Spearman's rho	How often did you travel before the COVID-19 pandemic?	Correlation Coefficient	1.000	-.229**
		Sig. (2-tailed)	.	.000
		N	265	265
	To what extent, on a scale of 1 to 5, do you think you will travel in 2022 in the context of the current situation regarding the COVID-19 pandemic?	Correlation Coefficient		1.000
		Sig. (2-tailed)		.
		N		265

** Correlation is significant at the 0.01 level (2-tailed).
Source: Research results, 2022.

Table 3 shows a statistically significant negative correlation (r = -0.229) between the variable "How often did you travel before the COVID-19 pandemic?" and "To what extent do you think you will travel in 2022 in the context of the current situation regarding the COVID-19 pandemic?", so that those respondents who travelled often before COVID-19 think they will travel less in 2022 in the context of the current situation regarding the COVID-19 pandemic.

5. DISCUSSIONS

The results of the study showed that the respondents who travelled frequently before and during the COVID-19 pandemic think that they will travel less in 2022 in the context of the current situation regarding the COVID-19 pandemic. The results of a study conducted in China in 2020 showed that the pandemic can cause fear of travel (Zheng *et al.*, 2021), which is in agreement with this study.

This study showed that those respondents who own a car will travel more in 2022 than respondents who do not own a car, in the context of the current situation regarding the COVID-19 pandemic. The findings of the study also show that respondents aged 31–50 will travel more in 2022 than the older respondents, that respondents who are employed will travel more in 2022 than pensioners, that respondents living in a household of 1–2 members travel more than respondents who live in a household of 5 or more members, that respondents who have a post-graduate education will travel more than respondents who have an elementary education only, and that respondents who have a monthly income of over 2,500 BAM will travel more in 2022 than respondents with a monthly income between 500 and 1,500 BAM.

The study "The dynamics of travel avoidance: The case of Ebola in the U.S." examined the factors that influenced the avoidance of domestic travel by Americans due to confirmed cases of Ebola in the United States in late 2014. It was determined that sensitivity and self-efficacy significantly influence the avoidance of domestic travel. The findings also supported the significant role of perceived risk, subjective knowledge, age, and gender. In particular, several studies reported that older travellers were more willing to postpone their trips compared to younger travellers (18–35 years) during the H1N1 outbreak (Leggat *et al.*, 2010; Sharangpani *et al.*, 2011). The results of an online survey conducted by Jones & Salathe (2009) during the beginning of the swine flu outbreak explained that older age was associated with more avoidant behaviours, including avoiding large gatherings and public transportation. The findings of this study confirm the results of previously conducted research.

Furthermore, this study is in agreement with the study titled "Exploring the impacts of COVID-19 on travel behaviour and mode preferences", which established that gender, car ownership, employment status, travel distance, and the primary purpose of travel are significant predictors of mode choice before and during the COVID-19 pandemic.

Cahyanto *et al.* (2016) concluded that perceived vulnerability, perceived risk, subjective knowledge, and self-efficacy influence the significant avoidance of domestic travel. Demographic characteristics such as age and gender were also found to be significantly related to travel avoidance. Kim *et al.* (2017) examined the differences in travel behaviour in Seoul, South Korea before and after the MERS outbreak using data from smart cards linked to transit use. The findings of that study showed that travel behaviour is significantly influenced by fear. That is, travel frequency was significantly reduced in Seoul after the 2015 MERS outbreak. Statistical analyses further revealed that land prices, the availability of potential MERS hotspots in the analysis area, the number of businesses and restaurants, and the number of people over 65 years of age are variables that significantly influence the reduction in travel frequency during MERS.

6. CONCLUSIONS

Like any other pandemic, COVID-19 caused significant changes on all continents, in all countries, regions, urban and rural communities, families, the way of thinking of each individual. Ultimately, the pandemic affected the way of life (Butu *et al.*, 2020). Domestic and international flights were halted in most countries, and travel restrictions made tourism and even essential travel scarce. Most tourism-related businesses, such as accommodation facilities, restaurants, and travel agencies, were closed or operating at limited capacities, such as airlines. This has led to uncertainty, followed by a reluctance to travel even after restrictions were eased. Thanks to COVID-19; tourists' behaviours, requirements, and even their travel attributes changed. Identifying the change in consumer behaviour, especially in the choice of destinations and services, is of vital importance for restoring the lost trust of tourists and reviving tourism (Mirzaei, Sadin & Pedram, 2021). Therefore, this research analysed the change in tourist behaviour patterns due to the outbreak of COVID-19 and compared it with previous habits related to tourist trips.

It should be noted that there are some limitations associated with this study. First, this study is based on data collected through an online survey of the inhabitants of Bosnia and Herzegovina. Bosnia and Herzegovina had a different level of restrictions during the pandemic and different percentages of the infected population than the rest of the world. Second, only those who had Internet access, namely those who had access to Facebook or e-mail, could answer the questionnaire. Therefore, generalizing the results to the average population in Bosnia and Herzegovina may not be practical. In addition, it is likely that the respondents did not give an honest answer about their travel habits, namely about the frequency of travel before the COVID-19 pandemic, because the results showed that those respondents who travelled often before COVID-19 thought that they would travel less during the pandemic.

Increasing the sample size and the sample diversity is recommended for future research in order to address these issues. In addition, the epidemic is still active, creating serious health and economic problems around the world, so the further study of this topic in new situations, in different parts of the world, can provide a significant amount of useful information. This study can be continued in the future, being an interest for researchers who expand the geographical area or deal with tourism, or serving as a starting point for a comparative analysis. Given the possibility that outbreaks of COVID-19 and similar viruses will re-emerge in the future, alongside the emergence of additional health crises, the findings may help the tourism industry in planning and responding to other health problems. The results of this study could be useful in travel planning based on travel habits during various crises in tourism, including epidemics, but also in the development of various policies during crisis situations.

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LA RÉPARTITION GÉOGRAPHIQUE DES POPULATIONS DE BUFFLES ÉLEVÉES SUR LE TERRITOIRE DE LA ROUMANIE AU DERNIER SIÈCLE

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Mots clés: populations de buffles, répartition géographique, dynamique, la période entre 1920 et 2019, Roumanie.

The geographical spread of the water buffalo populations raised on the territory of Romania in the last century. After bulls, buffaloes are the most important group of cattle. Buffalo populations have an obvious practical importance for milk production and, to a lesser extent, for muscle work (traction for various agricultural works). A geographical approach to the presence of water buffaloes in Romania has not been carried out until this day. On the territory of Romania, buffaloes are raised only in rural households. Between 1920 and 1980, the number of buffaloes varied between 135,000 and 180,000 head. The lowest number (135,000 specimens) was recorded in 1946, and the maximum population (almost 200,000 specimens) was reached in 1985, the largest in the previous century. Subsequently, the number of buffaloes decreased sharply, so that in 2019 the population was 90% smaller compared to that of 1985, the causes of this decrease being rather convoluted. The main breeding area of this mammal is Transylvania.

1. INTRODUCTION

Les buffles sont des mammifères qui appartiennent au gros bétail à cornes. Après les taureaux, les buffles constituent le groupe bovin le plus important.

Les populations de buffles ont une importance pratique évidente pour la production laitière et, dans une moindre mesure, pour l'énergie (traction pour divers travaux). Le lait et les produits laitiers ont des propriétés nutritionnelles supérieures et sont très appréciés des consommateurs. Les buffles ont également d'autres caractéristiques importantes, telles que: une grande longévité, une résistance aux maladies, une adaptabilité aux différentes conditions physico-géographiques, aussi qu'une bonne utilisation de la végétation des prairies peu productives.

Ce sont des ruminants résistants et rentables, tenaces et patients, qui impressionnent par leur apparence.

Une approche géographique de la présence des buffles en Roumanie n'a pas été réalisée jusqu'à présent.

La recherche a été menée sur plusieurs années. Ils ont poursuivi lidentification des données statistiques pertinentes à partir de 1920, après la création du territoire national actuel. Parallèlement des visites de terrain ont été réalisées dans différentes régions du pays où sont élevés des buffles.

2. LES CARACTÉRISTIQUES BIOÉCOLOGIQUES DES BUFFLES

La taille moyenne varie entre 125 et 145 cm pour les mâles et entre 120 et 140 cm pour les femelles, selon l'habitat etc. (Georgescu, 2008). Les buffles de la plaine du sud de la Roumanie, comparés à ceux de la Transylvanie, sont légèrement plus petits.

Ils ont un squelette solide et des muscles bien développés, ayant ainsi une constitution robuste. Par conséquent, le poids moyen de la femelle est de 545 kg, et celui du mâle – de 665 kg (Vidu, Bota, 2014). Mais il y a aussi des spécimens qui pèsent plus d'une tonne.

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La tête est grande, le front large et convexe, les oreilles mobiles et le museau luisant et humide. Les cornes, épaisses et rugueuses, ont la forme d'une faucille (d'une lune croissante), orientées vers le bas et vers l'arrière, après quoi elles se courbent vers le haut, ayant une longueur de 40 à 70 cm et une couleur gris-noir. Elles sont plus longues chez les femelles que chez les mâles.

La poitrine est bien développée. La queue a des poils courts, et seulement à l'extrémité elle a des poils plus longs. La maturité physique est atteinte après l'âge de 6 ans (Coroian, Coroian, 2011).

Le buffle est un mammifère noir monochromatique, certains spécimens ayant des variétés de couleurs (gris, brun).

Sa peau est épaisse (6–7 mm), couverte des poils, également noirs, mais épars et grossiers. À la naissance, les veaux (appelés bufflons) ont un poil riche et brillant, qui devient plus clairsemé vers l'âge de 2 ans et, à mesure que l'animal vieillit, reste très clairsemé.

Leur peau est beaucoup plus sensible que celle du reste des animaux domestiques. Ils ont peu de poils, et la graisse sécrétée en trop grande quantité par les glandes sébacées de la peau s'oxydant au contact de l'air irrite la peau, alors que les buffles ont besoin de nettoyer leur peau par des bains et des bains de boue. À cela s'ajoutent les irritations dues aux mouches ou aux moustiques: le bain et la couche de boue déposée sur la peau protègent également la peau du buffle. En même temps, la boue étouffe les autres parasites qui se trouvent sur le corps de ces animaux.

Les buffles peuvent marcher à travers les marécages, ils peuvent très bien nager sur plusieurs kilomètres et plonger jusqu'à ce que seules leurs têtes ou même leurs narines restent au-dessus de l'eau, et ainsi ils peuvent rester (ou même dormir) longtemps (en été, lorsque les températures sont les plus élevées).

Les yeux des buffles sont noirs, grands et expressifs. Ce mammifère a une bonne vision en forte lumière, mais aussi en faible lumière, ce qui lui permets de brouter aussi bien le jour que le soir et la nuit.

Au sol, il s'oriente assez rapidement et facilement, selon ses caractéristiques et la position du soleil (ils reconnaissent le chemin du retour du champ, et dans les villages le ménage où ils doivent se rendre, la place de l'écurie etc.).

Le dimorphisme sexuel est très peu prononcé.

Les buffles sont des mammifères forts, ils ont une bonne santé, ils ont une résistance aux maladies (Velea, Zanc, 2011). Ce fait a constitué un grand avantage de leur croissance dans les ménages des paysans.

Ils ont une longévité biologique très élevée de 20 à 30 ans (Georgescu, 2008). Il y avait des spécimens qui ont eu une longévité de plus de 30 ans. Les instincts maternels et défensifs sont bien mis en évidence.

Le système digestif est bien développé, tout comme la cavité buccale, qui a de fortes mâchoires avec de grandes incisives dures. En même temps, les compartiments gastriques et leurs glandes accessoires sont très développés. Le gros abdomen permet au buffle d'ingérer de grandes quantités de fourrage.

Les buffles sont des mammifères plus « vivaces » que les taureaux. Bien que généralement doux, les buffles sont facilement irritables et têtus. Avec les éleveurs et ceux qui les soignent, ils créent des relations d'attachement et de dévouement. Mais quand il y a des étrangers, les buffles ont d'abord peur, puis ils deviennent violents et peuvent même attaquer, ne laissant pas ces gens s'approcher. Par conséquent, il y a eu des cas où les mouvements des buffles nerveux étaient très soudains, entraînant des blessures à des inconnus.

La valeur biologique de la viande de buffle est inférieure à celle des taurines, mais elle constitue une riche source de protéines, de substances minérales, et le foie contient des vitamines A et D.

L'âge d'introduction à la reproduction est élevé (24–36 mois), la durée de gestation est longue (10,5–11 mois), l'intervalle entre les vêlages est également long (18–20 mois); il y a aussi des cas de buffles qui ont vêlé à 20–23 ans (Georgescu, 2008).

L'élevage des buffles est principalement basé sur les pâturages naturels. Ils broutent en fonction du temps et de l'état de l'herbe. Ce procès commence en avril-mai et dure souvent jusqu'aux premières chutes de neige. Les gardiens des troupeaux étaient même appelés « gardiens de buffles ». En cas de manque de pâturage ou d'accès à celui-ci, les éleveurs se promènent avec leurs animaux sur les bords des routes, des fossés, des chemins, des canaux (il y avaient aussi des cas où ils laissaient les animaux même attachés sur des champs).

Le lait de bufflonne est très précieux car il contient un pourcentage élevé de matières grasses (7,8%), de protéines et de matière sèche. En raison de sa teneur en matières grasses plus élevée (le double par rapport à celle de la vache), le lait de bufflonne a une valeur énergétique beaucoup plus élevée.

3. TÉMOINAGES TOPONYMIQUES SUR LA PRÉSENCE DE BUFFLES

Nous avons également réussi à identifier une série de toponymes qui attestent de l'existence de ce mammifère:

- dans la plaine alluviale du Danube avant les vastes travaux d'amélioration des terres de 1950 à 1975 se trouvaient: *Lacul Bivolilor* (le lac de buffles) et *Canalul Bivolilor* (le canal des buffles) à côté de la commune de Suhaia (comté de Teleorman); le marais de *Bivolăria* près du village de Malu (comté de Giurgiu), le lac *Balta Bivolului* existait sur le territoire de la commune de Borcea (comté de Călărași); *Lacul Bivolița* (le lac de la bufflonne) se trouvait dans la commune de Spanțov (comté de Călărași) et *Lacul Bivolu* (le lac du buffle) se trouvaient près de Năsturelu (comté de Teleorman); et dans le Delta du Danube, non loin de Sulina, se trouve *Gârla Bivolului* (le bras du buffle);
- pour la Plaine Roumaine, nous mentionnons: *Lacul Bivolul* qui était près de Roșiori de Vede; le *Pâturage Bivolu* près de Budești (comté de Călăraşi); *Lacul Bivolului* dans la plaine alluviale de l'Olt sur le territoire de la commune de Saelele (comté d'Olt); *Lacul cu Bivoli*, toponyme de la plaine alluviale de Câlnișteа, près du village de Hulubești (comté de Giurgiu); Le gué *Bivolăria* sur la rivière Călmățui dans la commune de Putineiu (comté de Teleorman); *Bivolița* est le nom d'une terre près de Brezoaia (comté de Dâmbovița), *Lacul Bivoli* existait dans la plaine alluviale du Buzău près de Mărăcineni (comté de Buzău), *Insula Bivolilor* (l'île des buffles) du lac Pantelimon est près de Dobroești (comté d'Ilfov), et dans le comté de Teleorman il y avait le village de *Bivolița* (la Bufflonne), aujourd'hui appelée Copăceanca (commune de Călinești);
- en Moldavie, nous avons identifié: *Dealul Bivolul* (la colline du buffle) dans la région du village de Buznea de la ville de Târgu Frumos (comté de Iași); le village de *Bivolari* (bergers á buffles dans la commune de Dobârceni, comté de Botoșani) et à proximité *Valea Bivolarilor* (la vallée des bergers á buffles); *Bivolaș* (le bufflon), *Bivolari*, colline et forêt de la commune de Pomârla (comté de Botoșani), à côté de laquelle se trouve le ruisseau du même nom, affluent de la Jijia; *Bivolăria* (élevage de buffles) – colline et prairie près de la ville de Pașcani; *Bivolu Mare* (le Grand Buffle) (aujourd'hui Viișoara) et *Bivolu Mic* (le Petit Buffle) (aujourd'hui Viișoara Mică) sont des villages du comté de Botoșani (la commune de Viișoara), à côté d'eux se trouve *Dealul Bivolul*; la commune de *Bivolari* (comté de Iași) et la route forestière *Bivolăria* dans la commune de Vânători, comté de Neamț;
- de la région de la Bucovine nous citons: le village de *Bivolăria* dans la commune de Vicovu de Sus; la forêt de *Bivolăria* dans la commune de Broșteni et la crête de *Bivolul* dans les montagnes de Stânișoara;
- pour d'autres régions de Roumanie nous mentionnons: *Lacul Bivolilor* dans la commune de Lapoș (comté de Prahova); la crête de *Bivolaru* près du village de Romani (ville de Horezu,

comté de Vâlcea); la crête de *Picioru Bivolului* dans les collines d'Istriței, près de Jugureni (comté de Buzău); *Bivolari* était un village de la commune de Jiblea (comté de Vâlcea), où se trouvait l'élevage de buffles du monastère de Cozia, et un quartier de la commune de Glogova (comté de Gorj) s'appelait aussi *Bivolari*.

4. LA DYNAMIQUE SPATIO-TEMPORELLE DES POPULATIONS DE BUFFLES SUR LE TERRITOIRE DE LA ROUMANIE AU DERNIER SIÈCLE

La composition de cette synthèse s'est basée sur l'identification et l'analyse des données relatives aux buffles à partir des recensements/inventaires d'animaux domestiques réalisés pendant 11 ans, à savoir: 1920, 1930, 1935, 1946, 1966, 1970, 1981, 1985, 2007 et 2019. Tout au long de la période considérée, la principale région de reproduction de ce mammifère était la Transylvanie (y compris Crișana et Maramureș).

4.1. Après la Première Guerre mondiale (l'année 1920)

A cette époque, 145.858 buffles étaient élevés en Roumanie. La majorité des spécimens existaient dans les comtés: Târnava Mare 23.295 (16,0% du total national), Cluj – 19.008 (13,0%), Făgăraș – 12.465 (8,5%) et Durostor – 10.157 (7,0%). Ces 4 comtés avaient à eux seuls 44,5% de la population de buffles du pays.

Il y avait moins de 20 spécimens dans les comtés: Bacău, Botoșani, Covurlui, Dorohoi, Fălciu, Muscel, Neamț, Rădăuți et Suceava. Ils n'étaient pas élevés dans 5 comtés: Câmpulung, Iași, Timiș-Torontal, Trei Scaune et Tutova (Fig. 1).

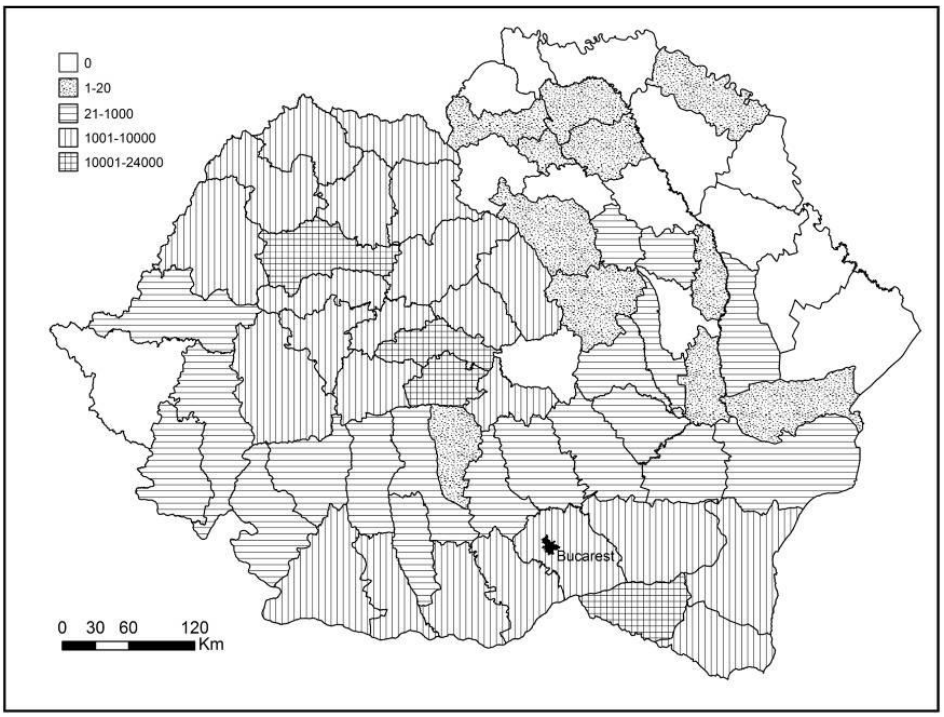

Fig. 1 – Nombre de buffles par comté en 1920 (spécimens).

Par province nationale, la population totale était répartie comme suit: dans la Transylvanie – 106.322, dans Dobroudja – 18.461, dans Olténie – 7.249, dans Munténie – 7.133, au Maramureș – 4.682, dans Crișana – 1,695, en Moldavie – 240, au Banat – 76. Comme on peut le voir, 72,9% était en Trasylvanie, 12,7% à Dobroudja et seulement 14,4% dans le reste des provinces.

Sur le total enregistré, 53,2% étaient des bufflonnes, 27,4% des bufflons et 19,4% des buffles.

4.2. Le contexte en 1930

L'effectif avait atteint 177.008 buffles. La majorité des spécimens existaient dans 6 comtés: Făgăraș – 34.960 (19,8% du total national), Cluj – 22.747 (12,8%), Someș – 15.548 (8,8%), Târnava Mare – 14.892 (8,2%), Sălaj – 12.384 (7,0%) et Durostor – 11.703 (6,6%). Tous ces 6 comtés abritaient 63,2% de la population de buffles du pays.

Moins de 10 buffles étaient élevés dans 6 comtés (Baia, Covurlui, Dorohoi, Fălciu, Vaslui et Vâlcea). Ce mammifère était absent des comtés de Bacău, Caraș, Iași et Putna.

Par province, la population était repartie de la manière suivante: Transylvanie – 132.442 têtes, Dobroudja – 16.543, Munténie – 14.788, Maramureș – 6.048, Crișana – 5.318, Olténie – 1.498, Moldavie – 278 et Banat – 93. Comme on peut le voir, 74,8% du total national existait en Transylvanie, 9,3% en Dobroudja, 8,4% en Munténie et 7,5% dans toutes les autres provinces du pays.

Sur le total, 64,1% étaient des bufflonnes, 12,3% des bufflons et 13,6% des buffles.

4.3. L'année 1935

À ce moment-là, plus de buffles ont été signalés dans le pays – 185.789. La plupart d'entre eux existaient dans les comtés: Făgăraș – 29.517 (15,9% du total national), Cluj – 26.869 (14,5%), Sălaj – 17.609 (9,5%), Someș – 14.934 (8,0%), Târnava Mare – 14.205 (7,6%), Durostor – 11.615 (6,3%) et Sibiu – 11.357 (6,1%), qui représentaient 67,9% du total national.

Il y avait moins de 20 buffles dans 5 comtés: Baia, Iași, Muscel, Neamț et Vaslui. Les buffles n'existaient pas dans 6 autres comtés: Bacău, Caraș, Dorohoi, Putna, Roman et Satu Mare.

Les populations des différentes provinces de Roumanie étaient les suivantes: Transylvanie – 143.357 exemplaires, Munténie – 16.139, Dobroudja – 14.812, Crișana – 8.194, Olténie – 1.755, Maramureș – 1.175, Moldavie – 215 et Banat – 142. Plus des ¾ d'entre eux se trouvaient en Transylvanie.

4.4. Après la Deuxième Guerre Mondiale (l'année 1946)

Le nombre total de buffles existant dans le pays après cet événement tragique n'était que de 135.348, ce qui signifie une diminution de 27% par rapport à 1935. La plupart d'entre eux étaient élevés dans 4 comtés: Făgăraș – 25.301 (18,7% du total national), Cluj – 20.596 (15,2%), Bihor – 14.490 (10,7%) et Târnava Mare – 11.443 (8,4%), ce qui représentaient plus de la moitié (53%) du total national.

Moins de 20 buffles étaient élevés dans 6 comtés (Argeș, Gorj, Putna, Covurlui, Tecuci et Vâlcea), et dans 14 comtés ce mammifère n'existait pas (Bacău, Baia, Botoșani, Caraș, Câmpulung, Dorohoi, Fălciu, Iași, Muscel, Neamt, Rădăuți, Suceava, Tutova et Vaslui) (Fig. 2).

Par province nationale, la population totale était répartie comme suit: Transylvanie – 104.053, Crișana – 12.191, Munténie – 11.244, Maramureș – 6.651, Olténie – 813, Dobroudja – 221, Banat – 123 et Moldavie – 52. Comme on peut le voir, 76,9% de la population nationale existait en Transylvanie, puis 9,0% en Crișana, 8,3% en Munténie et seulement 5,8% dans toutes les autres provinces du pays.

Sur le total enregistré, 68,1% étaient des bufflonnes, 21,7% des bufflons et 10,2% des buffles.

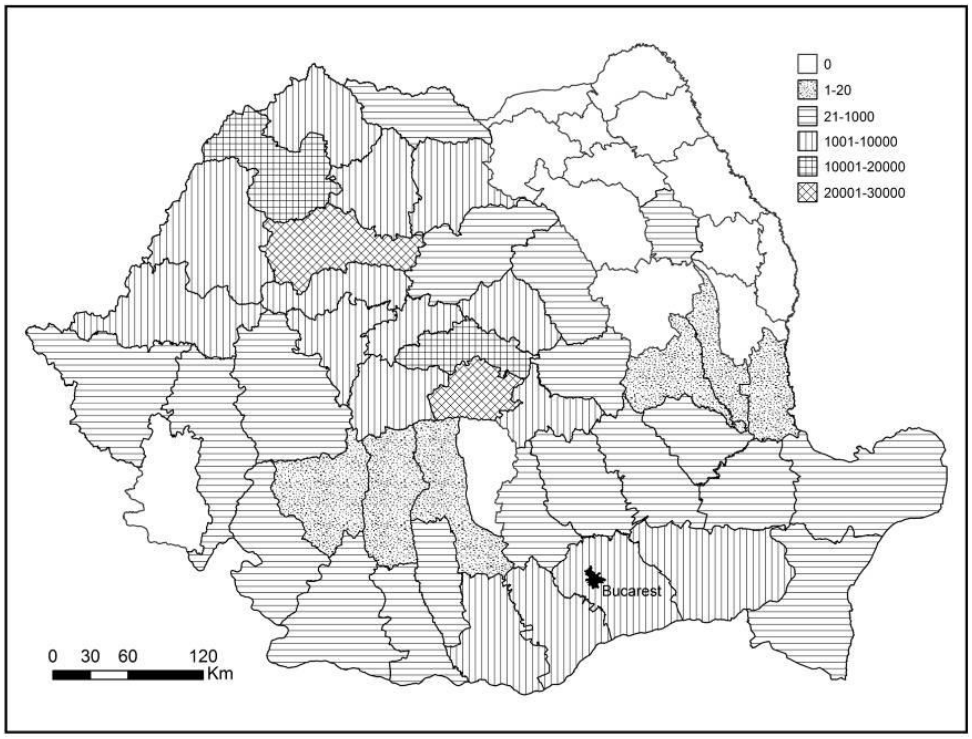

Fig. 2 – Nombre de buffles par comté en 1946 (specimens).

4.5. Au recensement du 3 janvier 1966

A cette époque, 154.813 buffles étaient élevés en Roumanie. Le plus grand nombre de spécimens existait dans deux régions: Cluj – 58.115 (37,5% du total national) et Braşov – 46.863 (30,3%), c'est à dire 67,8% de la population de buffles du pays.

Les provinces roumaines avaient les chiffres suivants: Transylvanie – 111.442 spécimens (72% du total national), Crişana – 21.070 (13,6%), Maramureş – 17.240 (11,1%), Munténie – 4.127, Olténie – 510, Banat – 188, Moldavie –168 et Dobroudja – 68, ces 5 dernières provinces ne ramassant que 3,3% du total national.

Les districts comptant le plus grand nombre de buffles étaient: Făgăraş avec 20.397 exemplaires, Huedin avec 14.361, Zalău avec 11.048 et Dej avec 10.290. Ainsi, bien que ces 4 districts n'occupassent que 2,4% du territoire du pays, ils abritaient 36,2% de la population de buffles de Roumanie.

Entre 2.000 et 10.000 spécimens existaient dans les districts: Rupea, Sibiu, Turda, Aleşd, Oradea, Şimleul Silvaniei, Agnita, Mediaş, Gherla, Beiuş, Gurahonţ, Cehu Silvaniei, Lăpuş Somcuta Mare et Oaş, et entre 1.000 et 2.000 dans les districts: Bistriţa, Zimnicea, Sfântu Gheorghe, Sighişoara, Aiud, Satu Mare, Târnăveni, Sighet et Odorhei.

En 1966, moins de 10 buffles étaient élevés dans 22 districts (par exemple Curtea de Argeş, Focşani, Medgidia, Caransebeş, Calafat, Târgovişte, Rădăuţi, Slobozia, Hârşova etc.).

Sur les 177 districts du pays à l'époque, le buffle n'existait que dans 99, ce qui représentait un peu plus de la moitié du nombre total.

Du troupeau enregistré, 56,5% étaient des bufflonnes, 2,1% des buffles et 41,4% des bufflons.

4.6. Le contexte au 3 janvier 1970

Dans le pays il y avait 175.236 buffles, presque 80% d'entre eux dans 6 comptés: Cluj – 32.716 (18,7% du total national), Sălaj – 30.855 (17,6%), Braşov – 23.676 (13,5%), Sibiu – 18.592 (10,6%), Bihor – 18.059 (10,3%) et Maramureş – 14.755 (8,4%).

En nombre totalement insignifiant (moins de 10), ce mammifère existait dans 7 comtés (Caraş-Severin, Constanţa, Dâmboviţa, Galaţi, Gorj, Iaşi et Suceava), et dans 6 comtés il n'y en avait aucun (Argeş, Botoşani, Mehedinţi, Neamţ, Prahova et Vaslui).

Dans les provinces nationales, les populations de buffles comptaient comme suit: Transylvanie – 125.233 spécimens, Crişana – 24.080, Maramureş – 22.287, Munténie – 2.184, Dobroudja – 704, Olténie – 555, Banat – 100 et Moldavie – 93. Ainsi, 71,5% de la population nationale se trouvait en Transylvanie, puis 13,7% à Crişana, 12,7% à Maramureş et seulement 2,1% dans les autres régions.

Du total enregistré, 55,4% étaient des bufflonnes, 42,6% des bufflons et 2,0% des buffles (utilisés pour la reproduction, aussi que pour des travaux). Les buffles les plus utilisés pour le travail existaient dans la partie nord-ouest du pays, dans les comtés: Cluj (535), Sălaj (453), Bihor (323), Satu Mare (268) et Maramureş (211).

4.7. Au début de l'année 1981

À cette époque, le total national était de 177.253 buffles, dont presque 80% étaient distribués dans 6 comtés: Sălaj – 34.405 (19,4% du total national), Cluj – 30.378 (17,1%), Braşov – 21.842 (12,3%), Bihor – 19.672 (11,1%), Maramureş – 17.029 (9,6%) et Sibiu – 16.194 (9,1%).

Dans 15 comtés, ce mammifère avait soit une présence symbolique – moins de 10 exemplaires (à Caraş-Severin, Gorj, Ialomiţa et Suceava), soit n'existait pas (à Argeş, Bacău, Botoşani, Constanţa, Dâmboviţa, Galaţi, Iaşi, Mehedinţi, Neamţ, Prahova et Vaslui).

Si l'on étudie la situation par province, le nombre total recensé à cette époque se répartissait comme suit: en Transylvanie – 121.039 spécimens, en Crişana – 26.854, en Maramureş – 24.960, en Munténie – 3.464, en Olténie – 811, au Banat – 59, en Moldova – 45 et en Dobroudja – 21. Ainsi, 68,3% du total national était présent en Transylvanie, 15,2% en Crişana, 14,1% en Maramureş et uniquement 2,4% dans les autres provinces.

L'effectif était structuré comme suit: 57,7% étaient des bufflonnes, 41,2% des bufflons et 1,1% des buffles. Le plus grand nombre de buffles utilisés pour des travaux existaient dans le comté de Cluj (166) et le moindre dans les comtés de Sălaj (86), Alba (84) et Bihor (75).

4.8. Au recensement du 1er février 1985

À cette époque, 199.040 buffles ont été enregistrés, soit la plus grande population nationale de buffles du dernier siècle. Le plus grand nombre existaient dans 6 comtés: Sălaj – 37.859 (19,0% du total national), Cluj – 33.417 (16,8%), Braşov – 27.560 (13,8%, Fig. 3), Bihor – 22.056 (11,1%), Maramureş – 18.766 (9,4%) et Sibiu – 17.059 (8,6%). Ces comtés contenaient ainsi plus des ¾ du total national. De l'autre côté se trouvaient les comtés de Ialomiţa (avec une bufflonne), Caraş-Severin et Dâmboviţa (avec 2 bufflonnes chacun).

Fig. 3 – Buffles («drigane») utilisés pour la traction dans le village de Grid (commune Părău) dans le comté de Brașov (photo: P. Urdea, 1985).

Dans 9 comtés ce mammifère n'existait pas (Argeș, Bacău, Botoșani, Constanța, Galați, Mehedinți, Prahova, Suceava et Vaslui) (Fig. 4).

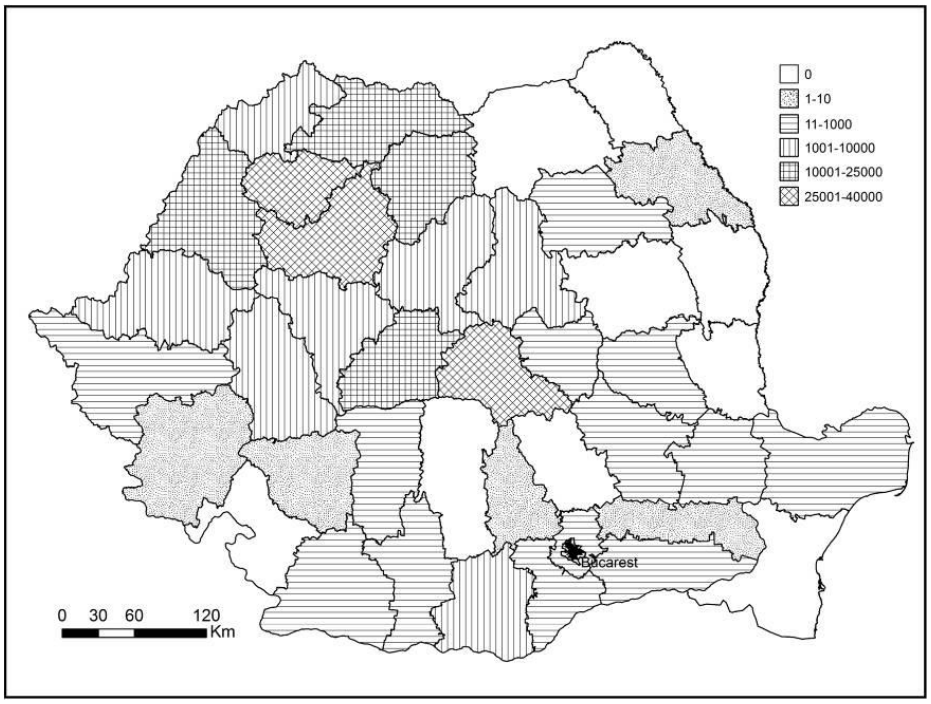

Fig. 4 – Nombre de buffles par comté en 1985 (specimens).

La répartition régionale était la suivante: en Transylvanie – 135.850 spécimens, en Crișana – 30.588, en Maramureș – 27.344, en Munténie – 4.092, en Olténie – 1.003, en Dobroudja – 70, en Moldavie – 50 et au Banat – 43. Comme on peut le voir, 68,2% de la population était en Transylvanie, puis 15,4% en Crișana, 13,7% en Maramureș et seulement 2,7% dans toutes les autres provinces du pays.

Sur le total, plus de la moitié étaient des bufflonnes, 48,6% des bufflons et 1,3% des buffles (de reproduction et de travail). La plupart des buffles utilisés pour le travail se trouvaient à l'extrémité nord-ouest du pays, dans les comtés de Maramureș (217), Satu Mare (204) et Cluj (199).

4.9. La répartition géographique des buffles à l'année 2007

Un peu plus de 42.000 buffles étaient élevés en Roumanie, dont 1/4 dans le comté de Sălaj précisément. Il en existait moins dans les comtés de Cluj (près de 6.000), Braşov, Bihor et Maramureş (entre 4.000 et 4.500 spécimens).

Onze comtés avaient moins de 10 exemplaires (Argeş, Botoşani, Constanţa, Covasna, Dâmboviţa, Galaţi, Ialomiţa, Iaşi, Mehedinţi, Suceava et Timiş), et il n'y en avait aucun dans les comtés de Gorj et Vaslui.

La situation dans les provinces était la suivante: en Transylvanie – 65,6% du total national, en Crişana – 15,2%, en Maramureş – 13,3% et 5,9% dans les autres provinces. Les détails sont présentés en ce qui suit.

En Transylvanie

Dans le comté d'***Alba***, les plus grands nombres se trouvaient à l'extrémité nord, soit dans la région d'Aiud (Mirăslău, Livezile), soit dans la région de la rivière Arieş à Ocoliş.

Dans le comté de ***Bistriţa-Năsăud***, des populations plus importantes existaient dans la vallée d'Ilişua (à Căianu Mic, Târlişua et Spermezeu), puis dans deux localités de la région de la rivière Someşul Mare (Ciceu Giurgeşti et Ilva Mică), mais aussi dans la commune de Chiochiş dans la plaine de Transylvanie.

Dans le comté de ***Braşov***, de nombreux buffles se trouvaient alors dans 3 unités géographiques:

– dans le Plateau de Târnava (à Bunești, Jibert, Soarș et Cața);
– dans la vallée de l'Olt à: Viștea, Șercaia, Părău (Figs. 1, 2), Comana, Hoghiz, Mândra, Voila, Ucea et
– dans la Dépression de Făgăraş (à Lisa, Hârseni, Recea, Sâmbăta de Sus).

Des grandes populations existaient également dans le comté de ***Cluj***. Ceux-ci se trouvaient principalement dans les communes des collines de Cluj (à Sânpaul, Recea-Cristur, Baciu, Aşchileu, Panticeu, Chinteni, Aghireş, Căpuş, Gârbău et Vultureni). D'autres existaient dans des localités de la vallée de Someş (à Răscruci, Mica, Jucu), de la région de Huedin (Sâncraiu, Poieni, Huedin), ou du sud du département (à Iara, Petreştii de Jos, Ciurila, Băişoara). Ici, nous mentionnons également le fait que, dans le village de Mera (de la commune de Baciu) situé à 13 km de Cluj-Napoca, un musée du buffle, unique en Roumanie, a été inauguré en 2009 (Varga, 2011; Fig. 5).

Fig. 5 – Le Musée du Buffle dans le village de Mera (comté de Cluj). S. Geacu (à droite) avec le professeur G. Varga, le fondateur du musée (2016).

Dans le comté de ***Hunedoara***, de nombreux spécimens ont été élevés uniquement dans 3 communes de la Dépression de Haţeg – Pui, Sălaşu de Sus et Bretea Română, mais aussi à Tomeşti dans la vallée de Crişul Alb.

De grandes populations existaient dans le comté de ***Sălaj***. Ils se trouvaient dans 3 unités géographiques:

– dans la Dépression d'Almaş-Agrij (à Gârbou, Hida, Creaca, Bălan, Românaşi, Cristolţ, Buciumi, Fildu de Jos, Almaşu, Cuzăplac, Agrij, Sânmihaiu Almaşului);
– dans la Dépression du Şimleu (à Cizer, Plopiş, Meseşenii de Jos, Bănişor, Valcău de Jos, Sâg) et
– dans la vallée du Someş (à Surduc, Rus, Năpradea, Ileanda, Gâlgău, Lozna, Jibou, Letca).

Dans le comté de Sibiu on élevait des buffles principalement dans deux régions:

– dans la vallée du Olt (à Porumbacu de Jos, Arpaşu de Sus, Turnu Roşu, Avrig) et
– dans le Plateau du Hârtibaci dans les communes voisines Alţâna et Nochrich.

D'autres communes avec de nombreux buffles se trouvaient près de Mediaş (à Bazna) et près de Sibiu (à Şelimbăr). Dans la localité de Cârţişoara au sud-est du comté on élevait aussi un grand troupeau de buffles.

Crişana

Dans le comté d'***Arad***, de grandes populations étaient dans les communes trouvées au contact des collines au pied des montagnes Codru-Moma avec la plaine alluviale du Crişul Alb (Dieci, Archiş, Dezna, Igneşti) et dans les Monts Apuseni à Almaş, Gurahonţ, Buteni et Halmagiu. De nombreux buffles se trouvaient également dans la région de la ville d'Ineu.

Sur le territoire du comté de ***Bihor***, de nombreux buffles existaient dans les localités de la Dépression de Beiuş (dans le Monts Apuseni) à Curăţele, Budureasa, Rieni, Buntesti, Remetea, Vaşcău, mais aussi dans les collines de Pădurea Craiului (à Vârciorog, Pomezeu, Copăcel, Dobreşti, Lăzăreni, Ţeţchea). Moins étaient à Borod, vers l'extrémité orientale du comté.

Maramureş

Dans le comté de ***Maramureş***, la zone de d'élevage intensif était la Dépression de Lăpuş (à Suciu de Sus, Cupşeni, Lăpuş, Târgu Lăpuş, Vima Mică, Coroieni). Quatre autres communes avec de grands troupeaux se trouvaient dans les vallées de Mara (Deseşti et Ocna Şugatag), Someş (Mireşu Mare) et Lăpuş (Remetea Chioarului).

Sur le territoire du comté de ***Satu Mare***, la plupart des buffles étaient élevés dans les localités situées au pied des Monts Oaş (Negreşti-Vama, Turţ, Gherţa Mică, Bătarci).

Dans le sud de la Roumanie

Plusieurs noyaux avec de nombreux buffles existaient également dans la Plaine Roumaine, comme suit: dans le comté de ***Călăraşi*** à Vasilaţi-Gălbinaşi; dans le comté de ***Giurgiu*** à Hulubeşti; dans le comté d'***Olt*** à Giuvărăşti et Rusăneşti et dans le comté de ***Teleorman*** à Măgura et Crângeni.

4.10. Les populations de buffles en 2019

Près de 19.000 buffles étaient élevés en Roumanie. Les populations étaient réparties dans les régions du nord-ouest (11.775 spécimens – 61,9%), du centre (6.052 spécimens – 31,8%) et du l"ouest du pays (1.147 spécimens – 6,0%). Seulement 0,3% de la population vit dans le sud de la Roumanie !

La plupart se trouvaient dans les comtés de Braşov, Cluj, Sibiu et Sălaj, dans les nombreuses localités (Fig. 6). Il y avait aussi quelques comtés où le nombre de buffles ne dépassait pas 10 exemplaires (par exemple Ilfov, Ialomiţa etc.).

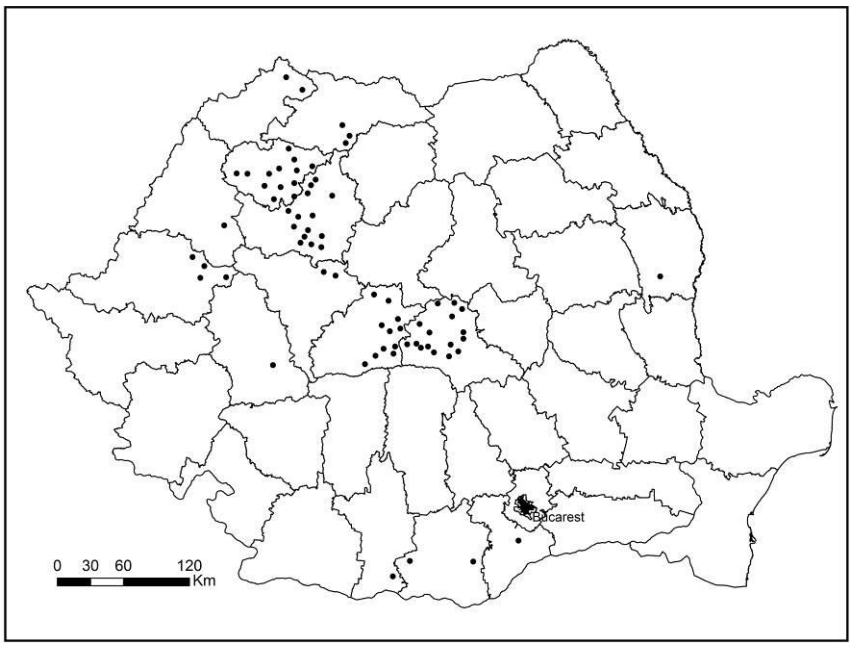

Fig. 6 – Unités administratives-territoriales (•) avec plus de 100 buffles en 2019.

Ci-dessous, plusieurs détails sont présentés.

Transylvanie

Dans le comté de ***Brașov***, de nombreux buffles existaient dans trois unités géographiques:

– la vallée de l'Olt (à Vișlea, Părău (Fig. 7), Șercaia, Ucea, Mândra, Comana, Hoghiz, Voila, Beclean);

Fig. 7 – Buffles dans le village de Grid (commune Părău) dans le comté de Brașov (photo: P. Urdea, 2020).

– dans le Plateau de Târnava (à Bunești, Soarș, Homorod, Cața, Cincu);

– dans la Dépression de Făgăraș (à Șinca, Hârseni).

Le buffle existe dans le comté de ***Cluj***, dans de communes réparties dans les collines de Cluj (à Sânpaul, Panticeu, Așchileu, Baciu, Gârbău, Aghireșu, Chinteni, Recea Cristur, Aluniș), dans les localités de la vallée de Someș (à Florești, Jucu, Vad, Dej, Iclod, Apahida, Mintiu Gherlii), dans les

Collines de Feleac (à Feleacu, Ciurila, Săvădisla, Petreștii de Jos) et dans la région de Huedin (à Huedin, Izvoru Crișului, Călățele, Poeni, Sâncraiu).

Dans le comté de ***Harghita***, la plupart des buffles étaient élevés dans 4 communes de son extrémité sud-ouest (Ocland, Săcel, Mugeni et Ulieș).

Dans le comté de ***Hunedoara*** la population maximale se trouvait dans la commune de Pui dans la Dépression de Hațeg.

Le comté de ***Mureș*** abritait la majorité d'exemplaires à Zagăr.

Dans le comté d'***Alba***, la plupart des spécimens se trouvaient dans la région d'Aiud, principalement à Aiud et Livezile, avec un plus petit nombre à Unirea et Mirăslău. Un petit noyau existait également dans la vallée de Târnava Mică, dont plus étaient à Jidvei.

Dans le comté de ***Bistrita-Năsăud***, les populations de buffles étaient concentrées à l'extrémité ouest (à Chiochiș, Târlișua, Căianu Mic, Ciceu-Giurgești, Spermezeu).

De grandes populations existaient dans le comté de ***Sălaj***. Ils se trouvaient dans trois régions :

- dans la Dépression Almaș-Agrij (à Gârbou, Hida, Românași, Dragu, Creaca, Fildu de Jos, Cristolț, Buciumi, Agrij, Almașu, Bălan, Cuzăplac, Zimbor);
- dans la Vallée de Someș (à Năpradea, Surduc, Ileanda, Jibou et Rus);
- dans la Dépression de Șimleu (à Bănișor, Valcău de Jos, Cizer, Meseșenii de Jos, Plopiș, Sâg).

Sur le territoire du comté de ***Sibiu***, les buffles étaient élevés dans deux zones:

- la vallée de l'Olt (à Arpașu de Jos, Porumbacu de Jos, Avrig et Turnu Roșu);
- le Plateau de Hârtibaci, dans les localités d'Alțâna, Ațel, Chirpăr, Agnita, Bruiu, Biertan, Bârghiș, Nocrich, Roșia, Vurpăr.

D'autres communes avec de buffles étaient Cârțișoara dans la dépression de Făgăraș et Bazna près de Mediaș.

Crișana

Dans le comté d'***Arad,*** le buffle existe dans deux communes dans la zone de contact des collines de Codru-Moma avec la prairie de Crișul Alb – Archiș et Dezna, mais aussi dans les Monts Apuseni dans les Dépressions de Gurahonț (à Dieci et Halmagiu).

Sur le territoire du comté de ***Bihor***, la plupart des buffles se trouvaient dans la dépression de Beiuș à Curățele, Budureasa, Vașcău, Rieni, Uileacu de Beiuș, Cărpinet, Pomezeu, Remetea. Ce mammifère était également élevé dans les collines forestières de Craiului (à Vârciorog, Dobrești, Lăzăreni, Copăcel).

Maramureș

Dans le comté de ***Maramureș***, la zone de d'élevage intensive est la dépression de Lăpuș (à Suciu de Sus, Lăpuș, Cupșeni, Vima Mică, Tg. Lăpuș, Coroieni et Cernești).

Le deuxième noyau de population se trouve dans la vallée de Someș à l'extrémité sud-ouest du comté dans les communes avoisinantes d'Ulmeni, Mireșu Mare et Sălsig. Il y avait pas mal de buffles dans la vallée de Lăpuș dans les communes voisines de Remetea Chioarului et Săcălășeni.

Sur le territoire du comté de ***Satu Mare***, la plupart des buffles étaient élevés dans des localités au pied des Monts Oaș (à Turț, Negrești-Vama, Bătarci, Certeze et Gherța Mică).

Dans la Plaine Roumaine

Pour le sud du pays, nous mentionnons les plus grandes populations existantes dans les comtés: ***Giurgiu*** (à Hulubești et Guruieni, Figs. 8, 9), ***Olt*** (à Rusănești) et ***Teleorman*** (à Măgura et à Crângeni).

Fig. 8 – L'un des deux troupeaux de buffles du village de Hulubești dans le comté de Giurgiu (photo: S. Geacu, 2022).

Fig. 9 – Buffles se baignant dans la rivière Clănița près du village de Guruieni dans le comté de Teleorman (photo: S. Geacu, 2022).

Il est également important de souligner que, ces dernières années, certains noyaux de population ont également été créés pour l'élevage de bufflonnes laitières, en particulier à proximité de certaines villes importantes, telles que: Vinga et Turnu, les deux localités pas loin d'Arad, près de Bârlad à Perieni, Florești près de Cluj-Napoca, Ardud pas loin de Satu Mare; Sânmartin près d'Oradea.

Cependant, sur les territoires de nombreuses municipalités, le nombre de buffles est très réduit. Par exemple, en 2007 il y avait 232 unités administratives-territoriales avec moins de 10 spécimens.

5. CONCLUSIONS

En Roumanie, les bufflonnes sont élevées dans les ménages pour la production de lait. Elles ont été utilisées moins pour la traction ou les travaux agricoles. À cause du fait que toute espèce animale connaît toujours des changements dans les troupeaux (Drugescu, 1990), nous avons également mis en évidence ces aspects au sein des populations de buffles (Tableau 1).

Tableau 1

La dynamique du troupeau de buffles en Roumanie entre 1920 et 2019 (spécimens)

Année	**1920**	**1924**	**1927**	**1930**	**1932**	**1935**	**1946**	**1966**
Ex.	145.858	184.755	192.278	177.008	194.624	185.789	135.348	154.813

Année	**1967**	**1968**	**1969**	**1970**	**1981**	**1985**	**2007**	**2019**
Ex.	170.834	180.721	178.043	175.236	177.253	199.040	42.119	19.021

Ainsi, dans l'intervalle 1920–1980, le nombre de buffles a varié entre 135.000 et 180.000 têtes. Le nombre le plus bas a été enregistré en 1946, conséquence de la Seconde Guerre Mondiale, et la population maximale, de près de 200.000 spécimens, a été atteinte en 1985. Cependant, depuis plus de deux décennies, le nombre de buffles a fortement diminué, de sorte que, en 2007, il était de 80% inférieur à celui de 1985. En 2019, il était de 55% inférieur à celui de 2007.

Si en 1920 la plupart des buffles étaient élevés dans l'ancien comté de Târnava Mare (dont le siège était à Sighișoara), dans les années 1930, 1935 et 1946, le comté le plus représentatif du pays à cet égard était Făgăraș. Plus tard, pendant longtemps, le nombre maximum a était enregistré dans les comtés de Cluj, Sălaj et Brașov.

Parmi les causes de la réduction dramatique du nombre de buffles, on cite tout d'abord le vieillissement des éleveurs qui ne peuvent plus les soigner et le manque d'implication de la jeune génération dans le procès d'élevage. Puis les buffles ont été remplacés par des vaches, dont on obtient plus de lait et qui ne sont pas difficiles à traire. Les buffles n'ayant qu'une reproduction naturelle, de nombreux villages de buffles sont resté sans de taureaux reproducteurs et, par conséquent, les bufflonnes ont été vendus. À cela s'ajoutent la baisse du prix du lait et la concurrence accrue des produits laitiers importés. Dans le même temps, nous mentionnons également le coût élevé de l'entretien des animaux et de l'achat du fourrage. En plus, vendre des produits laitiers est devenu de plus en plus difficile pour des raisons complexes. Par conséquent, de nombreux éleveurs ont vendu leurs buffles domestiques.

La principale région d'élevage de buffles est la Transylvanie, dont la population a détenu entre 65% et 77% du total national de buffles au cours du dernier siècle.

Comparativement, entre les années 2007 et 2019 seulement, les populations de buffles ont diminué très fort dans de nombreuses localités comme: Ocoliș, Mirăslău et Remetea (comté d'Alba), Almaș, Gurahonț et Ignești (comté d'Arad), Buntești, Rieni, Copăcel, Dobrești, Pomezeu et Vârciorog (comté de Bihor), Ciceu-Giurgești et Căianu Mic (comté de Bistrița-Năsăud), Mica et Poieni (comté de Cluj), Sălașu de Sus et Tomești (comté de Hunedoara), Almașu, Cizer, Plopiș, Surduc et Cuzăplac (comté de Sălaj), Sohatu (comté de Călărași), Ocna Șugatag (comté de Maramureș).

À présent, ce mammifère n'existe que dans des villages. Dans le passé, cependant, il y avait aussi des éleveurs dans les villes. Par exemple, en 1908, il y avait 2.803 buffles à Giurgiu et en 1916, il y avait 6.216 buffles même dans la capitale du pays. Et même après un demi-siècle, on pouvait les retrouver. Ainsi, en 1966, dans les territoires administratifs de certaines grandes villes de l'époque, il y avait 2.747 exemplaires à Cluj-Napoca, 1.117 à Baia Mare, 183 à Bucarest, 176 à Giurgiu, 49 à Sibiu, 42 à Arad, 33 à Brașov, 21 à Oradea.

En 2019, on élevait des buffles dans approximatif 600 unités administratives-territoriales.

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