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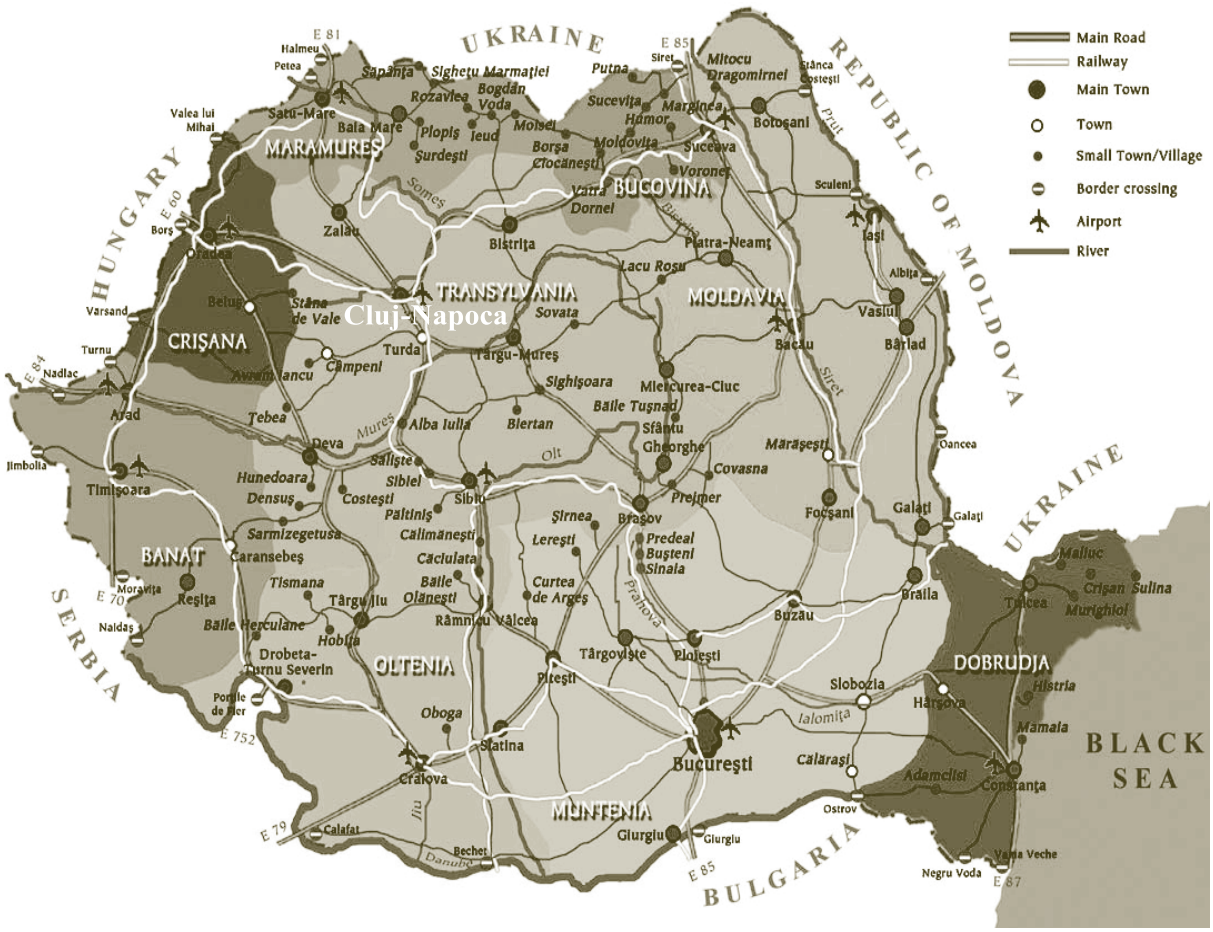

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EFFECT OF DOWN-HOLE LITHOLOGICAL VARIATION ON WATER BEARING CAPACITY OF SOME BOREHOLES IN ILORIN, NIGERIA

IROYE KAYODE ADEMOLA[1]

ABSTRACT. - Effect of Down-Hole Lithological Variation on Water Bearing Capacity of Some Boreholes in Ilorin, Nigeria. The paper attempts to explain the effect of downhole lithological variation on water bearing capacity of some boreholes in Ilorin Nigeria. Specifically, the study examined the lithological characteristics of the boreholes, assessed the variability in weathered overburden and analyzed the inter-relationships between lithology, hydrology and topography of the boreholes. Data used were extracted from twenty (20) borehole logs collected from the archive of Lower Niger Basin Development Authority in Ilorin. Information extracted from the borehole logs are: the number of lithological units intersected by each of the borehole and their depths, the nature of geological materials making up the lithological units and their moisture conditions. Information on coordinates and topographic heights of the boreholes are not given on the logs and those were collected from the field personally by the researcher using handheld GPS (Garmin GPS Channel 76 Model). The collected data were analyzed using descriptive statistics. Results reveal nine downhole lithological units with loamy and lateritic soil making up the first layer of lithology in 95% of the boreholes. Thickness of the top soil and the saprolite overlying the bedrock, has mean values of 4.2m and 11.3m respectively. Depth to water in the borehole ranged between 24.7 and 140m and with a mean value of 55.9m. Three (3) of the boreholes have two lenses of aquifer while the remaining seventeen (17) have one aquifer lens each. The three (3) boreholes with two aquifer lenses have their minor aquifers located within the saprolite. The main aquifer in most (65%) of the boreholes is located within the fractured basement while the remaining (35%) boreholes have their main aquifer located in the weathered basement. Correlation analysis revealed topographic elevation as one of the drivers of hydrology in the study area.

Keywords: *lithology, groundwater, saprolite, basement, topography*.

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INTRODUCTION

Groundwater is water existing in the voids of geological formations, in the pores and fissures of rocks below the surface of the Earth. It represents 0.58% of the total water resource available in nature and accounts for about 21% of global freshwater reservoirs (Monroe and Wicander, 2005). Okeola and Salami (2014) regard it as an important feature of the environment and an invisible part of the hydrological cycle. Groundwater remains the preferred source of drinking water globally (Guppy et al., 2018) and it makes a critical contribution to the progressive realization of the human right globally. According to Carrard et al. (2019), its development is considered a key strategy for addressing gaps in service delivery especially in developing countries where 2.1 billion people lack access to safely managed water and 844 million lack basic water (Velis et. al., 2017).

The importance of groundwater in meeting potable water demand in both rural and urban settlements in Nigeria cannot be over emphasized. This is due to its characteristics of high chemical and bacteriological quality at source, availability in-situ and its relatively low cost of development and maintenance of its equipment. Groundwater is often considered more reliable than surface water and more accessible because it can be directly exploited by users (Margat, 2013). According to Williams et al. (2014), groundwater could offer a potential source of water to supplement surface water sources or be used as a sole source supply for small communities and industries.

Apart from the aforementioned qualities of groundwater, the pathetic situation of public water supply through pipes in Nigeria has further endeared groundwater usage to many private individuals and some public agencies. Sule et al. (2016) observed that most settlements in Nigeria do not have access to improve water supply through pipe and where such facility exist according to them, they are either malfunctioning or broken down. The World Bank Group report as presented by Andres et. al. (2018) linked the non performance of water agencies in Nigeria to poor design, implementation and high cost. The report observed that the operating cost of most water agencies in Nigeria is too high because many of the agencies rely on diesel generators to power equipment since power supply in the country is erratic.

Although a number of studies such as Parameswari and Padmini (2018), Maity and Mandal (2019) and Pande et al. (2019) have reported the potential zones of groundwater as being generally determined by climate, landscape and environmental parameters of relief, slope, soil, land use/ land cover, etc., groundwater occurrence in any region is also influenced by geological and geomorphic conditions which ultimately control yields (Adimalla, 2020). Because of this, exploration for groundwater in regions underlain by crystalline basement

rock such as Ilorin, the study area in this investigation, can be quite challenging. More than 90 percent of the area is underlain by crystalline basement rocks of Precambrian age (Oyegun, 1983).

Crystalline rocks belong to the category of hard rocks that are virtually devoid of any primary porosity. The occurrence of groundwater in this rock type according to Wijesekera (1984) is dependent on the development of secondary porosity which might have resulted from structural deformations, weathering dissolution and mass movements. According to Gustafon and Krasny (1994), hydraulic conductivity in the fractured zone of the basement complex rock is spatially variable as the nature of the fractures and faults within the rock can make borehole yields differ by several orders of magnitude within the same rock unit and often within short distances.

A detailed study of the effect of lithological characteristics on the occurrence of groundwater is crucial to the development and management of water resources; this especially germane in basement complex area where groundwater occurrence exhibits great variability. Specifically, the study examined the lithological characteristics of some boreholes, assessed the variability in weathered overburden and analyzed the inter-relationship between lithologic, hydrologic and topographic parameters in the study area.

THE STUDY AREA

Ilorin, the capital city of Kwara State, Nigeria (fig. 1), is the study area in this investigation. The city was chosen for investigation for two reasons. The first reason is due to the increasing reliance on groundwater by residents of the city for various activities because of the failure of the public water supply agency in meeting demand. The second reason is due to the high failure rate of boreholes constructed in the city. Studies such as Ifabiyi and Ashaolu (2013), Aderibigbe et al. (2008) and Ijaiya (2000) have earlier investigated the problem of water supply in the city. Ilorin is situated in the north-central part of Nigeria and located between latitudes 8˚23' and 8˚34' North of the Equator and between longitudes 4˚29' and 4˚42' East of the Greenwich Meridian. Wet season is usually experienced in the region between the months of May and October while dry season is between November and April. The annual mean rainfall for the area is 1,200mm (Olaniran, 2002) and this exhibits double maximal pattern with peak periods in the months of July and September. Average relative humidity in the area is 79.7% and this varies seasonally.

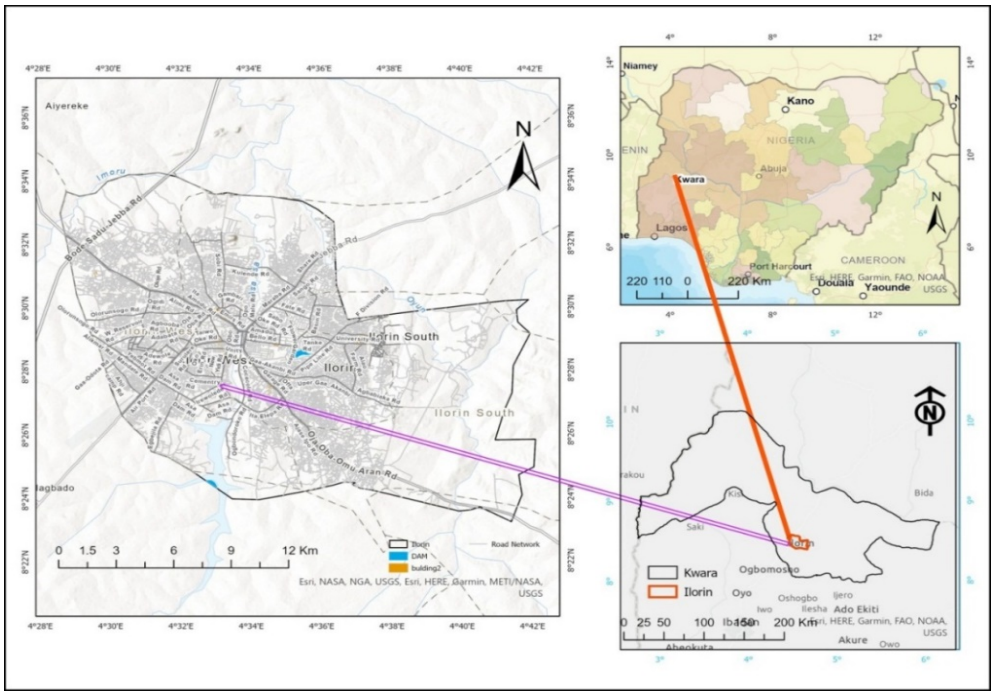

Fig. 1. Map of Ilorin with Kwara State and Nigeria as Insets.
Source: Kwara State Town Planning Authority (2021)

Ilorin is underlain by Precambrian basement complex, comprising mostly gneiss granite, schist and undifferentiated metasediment rock (Azeez, 1972). The overburden is composed mainly of clay, sand and silt (Areola, 1978). Substantial area of the city is also underlain by sedimentary rocks which contain laterites and alluvial deposits (Oyegun, 1983). Precambrian igneous and metamorphic rocks of basement complex are neither porous nor permeable except in places where they are deeply weathered or fractured (Clark, 1985). Lithological logs for the region as analyzed by Adelana and Olasehinde (2004) revealed that weathering is fairly deep and rocks have been jointed and fractured severely at between 30-68m below the surface. In some parts of the study area groundwater is difficult to access, especially during the dry season (Aderigbe et al., 2008). The city is drained mainly by River Asa which flows from South to North. Tributaries of River Asa in Ilorin are rivers Aluko, Okun, Osere, Agba, Atikeke and Amule. These rivers exhibit a seasonal flow pattern, with the minor streams drying up during the dry season (Oyegun, 1983).

METHODS

Data used in this study were obtained from lithological logs of twenty (20) drilled boreholes obtained from the Lower Niger Basin Development Authority Office in Ilorin. The locational positions of the boreholes are fairly distributed in the study area (fig. 2). Information obtained from the borehole logs include the number of lithological units intersected by the boreholes and their depth, the nature of geological material making up each lithological unit and their moisture condition. Information on coordinates and topographic height of the boreholes are not given on the logs and these were collected from the field personally by the researcher using hand held GPS (Garmin GPS Channel 76 Model).

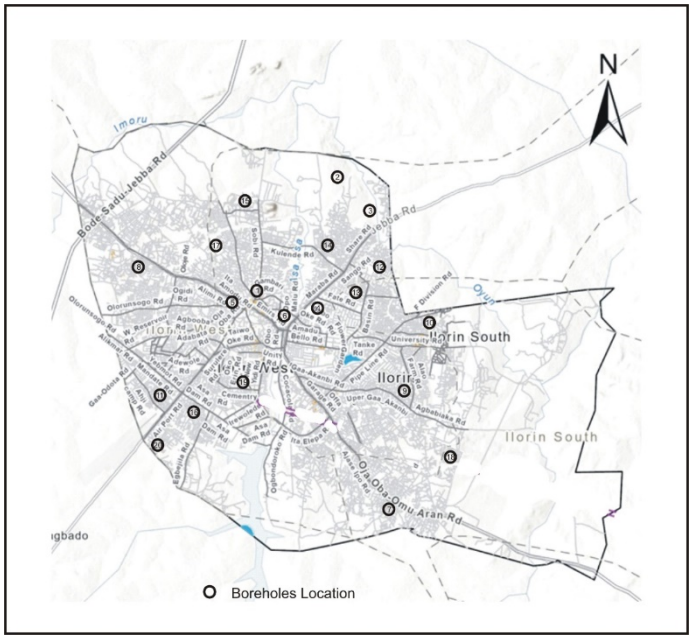

Fig. 2. Map of Ilorin showing Location of Studied Boreholes.
Source: author's fieldwork (2021)

Descriptive statistics were used to analyze the data. The means were used to measure the central location while the range, standard deviation, coefficient of variation were used to measure the degree to which the data collected deviate from average. Correlation matrix was generated to establish the inter-relationship between the hydrology (depth to water and borehole depth), lithology (number of lithological units and depth of regolith) and topography (elevation) of the study area.

RESULTS AND PRESENTATION

Location and Hydrogeological Characteristics of the Studied Boreholes

Table 1 presents the locational position of the studied boreholes, their elevations, depths and number of lithological units penetrated.

Table 1: Location and Hydrogeological Characteristics of the Studied Boreholes

S/N	Location Site	Longitude (O^0)	Latitude (O^0)	Ground surface elevation (m)	Depth of wells (m)	Depth to water table (m)	Lithological Units Penetrated
1	**Ojaoba**	$8^0$29'13"	$4^0$29'39"	297	53.00	45.0	ll,hl,bsfwb,wb,bs
2	**Budo Fulani**	$8^0$28'19"	$4^0$36'56"	354	100.00	85.0	ll,hl,sc,s,bs,fb
3	**Apata Yakuba**	$8^0$32'55"	$4^0$39'04"	365	96.60	74.4	ls,l,c,bs,wb
4	**Alalubosa**	$8^0$29'35"	$4^0$34'18"	287	58.00	50.0	ll,hl,bs,fwb,wb
5	**New Market**	$8^0$29'24"	$4^0$32'16"	294	30.70	24.0	ls,l,c,bs,wb
6	**Maternity**	$8^0$26'05"	$4^0$35'38"	348	89.00	79.0	ls,hl,bs,wb
7	**Ganmo**	$8^0$25'08"	$4^0$36'03"	360	150.00	140.0	ls,l,s,bs,fb
8	**Okaka**	$8^0$28'22"	$4^0$35'26"	329	70.00	61.0	ls,l,sc,bs,fb
9	**Gaa-Akanbi**	$8^0$27'47"	$4^0$34'48"	324	31.00	25.0	ls,l,s,bs,fb
10	**Tanke Bubu**	$8^0$28'35"	$4^0$36'53"	346	40.70	35.7	l,c,s,wb,bs,fb
11	**Mandate**	$8^0$28'18"	$4^0$30'07"	355	40.00	31.5	c,sc,c,s,fb
12	**Oke Andi**	$8^0$31'06"	$4^0$36'20"	284	64.40	57.2	ls,bs,fb
13	**Fate**	$8^0$29'16"	$4^0$36'02"	340	65.00	55.0	ls,c,bs,fb,bs,fb
14	**Zango**	$8^0$30'44"	$4^0$34'28"	275	38.00	31.0	ll,hl,bs,wb
15	**Sobi**	$8^0$32'30"	$4^0$33'25"	303	85.00	75.0	ls,ll,hl,bs,fb
16	**Odota**	$8^0$27'19"	$4^0$31'03"	319	55.00	50.6	l,sc,bs,fb,bs
17	**Balogun Fulani**	$8^0$29'49"	$4^0$33'11"	311	42.00	35.0	ls,sc,bs,wb,fb
18	**Fufu**	$8^0$29'35"	$4^0$34'17"	286	48.70	41.0	ls,cs,bs,fb
19	**Osere**	$8^0$28'01"	$4^0$32'14"	310	35.00	33.5	ls,c,wb,br
20	**Airport**	$8^0$26'38"	$4^0$30'28"	331	100.00	91.0	ls,l,s,bs,fb,bs
	Sum			6418	2030	1118	
	$\bar{x}$			320.9	101.5	55.9	
	SD			24.04	68.58	27.72	
	CV			7.49	67.6	40.64	

Lithological units: ll = Loose laterite, hl = Hard laterite, fwb = Fairly weathered basement, wb = Weathered basement, bs = Basement rock, sc = Sandy clay, s = Silt, l = Laterite, ls = Loamy Soil, c = clay

Source: Author's Fieldwork, 2021.

The topographical height of the studied boreholes range between 294 and 365m and with mean value of 320.9m. The coefficient of variation of 7.6% reveals no great disparity in topographical heights of the studied boreholes. Borehole depth range between 31 and 150m with a mean value of 101.5m and a coefficient of variation of 67.6%. This result shows that well depth is highly variable in the study area. Reason for this may not be unconnected with the nature of fracturing and weathering of the rock in the area.

Although the weathering profile of the study area can broadly be classified into three layers of top soil, saprolite and bedrock (Oluyide et al., 1998), a total of nine (9) different lithological units were penetrated by the twenty (20) boreholes investigated. These lithological units are loose laterite, hard laterite, fairly weathered basement, weathered basement and basement rock. Others include sandy-clay, silt, loamy soil and clay. The number of lithological units penetrated by each of the boreholes however ranged between three and six. While boreholes located in areas such as Tanke Bubu, Oja Oba, Budo Fulani, Balogun Fulani and Airport intersected the highest number of lithological units of six, boreholes located in Apata Yakuba, New Market, Ganmo, Okaka, Gaa-Akanbi, Mandate, Sobi, Odota and Balogun Fulani areas intersected five lithological units. Areas such as Zango, Fufu, Osere, and Maternity intersected four units and the borehole located in Oke Andi intersected the lowest number of lithological units of three.

The lithological succession in the study area as obtained from the borehole logs shows that loamy soil make up the first layer of the lithology in twelve (60%) of the boreholes, lateritic material in seven (35%) and clay in the remaining one (5%). Nature of top soil is very important in influencing infiltration process. Surface water is lost to the underground aquifers through the top soil (direct recharge) especially in places where the overburden has been weathered. The thickness of the top soil which has a mean value of 4.2m, is greater than 5m in four (20%) of the boreholes while it is less than 5m in seven (35%) of the boreholes.

The first lithological units in the boreholes are generally underlain either by clay or lateritic material. The nature of these two materials (clay and laterite) have resulted in the development of perched water table in four of the boreholes which are located in Gaa-Akanbi, Tanke Bubu, Adewole and Osere. Studies by Wright (1992) and Adelana and Olasehinde (2004) have earlier identified clay and laterite as the two main materials that can be found in the first two lithological sequences above crystalline basement rocks in tropical regions. The British Geological survey recognized these first two units in lithological sequences of weathering profile in crystalline basement rocks of tropical regions as the collapse zone (Gilespie et al., 2011).

The thickness of the saprolite in the studied boreholes ranged between 5 and 27.8m and with a mean value of 11.3m. Five (25%) of the studied boreholes have two aquifer lenses with the first (minor) lens located within the saprolite. This is understandable, because the saprolite is the weathered layer and one of the water bearing zones in basement area; according to Akanbi (2018), the saprolite is characterized by high porosity, and when the bedrocks are not fractured, it is the only alternative water bearing zones in basement area. LeGrand (1989) identified the saprolite as being characterized by low permeability and high porosity and thus functions as a reservoir that feeds water into fractures within the underlying bedrock.

According to Carrier et al. (2008), the most productive zone of groundwater, especially in basement complex area, is the lower part of the saprolite and the upper part of the fractured bedrock; with two parts generally complementing each other in terms of permeability and storage. The lower part of the saprolite is more productive in terms of groundwater because the upper part is usually more clayey and thus, have relatively low permeability and specific yield when saturated. Permeability in saprolite according to Wright (1992), commonly increases at lower levels because of lesser development of secondary clay minerals. For good ground water productivity, Akanbi (2018) observed that the saprolite should be more sandy to gravelly especially in areas underlain by unfractured and unweathered basement rock.

Depth to water in the studied boreholes range from the 24.7m observed in New Market to 140m observed in Ganmo. The mean depth to water is 55.9m. Adelana et al. (2008) have earlier observed that only few boreholes tap water below 60m in the study area. The 40.64% coefficient of variation on depth to water shows that the variability of water bearing capacity of the underlying geology in Ilorin is fairly high. Omoribola (1982) and Azeez (1972) have earlier identified crystalline basement rock which underlain the study area as poor aquifer because of its zero level of porosity and permeability.

The main aquifer in thirteen (65%) of the investigated boreholes is located within the fractured basement while the remaining seven boreholes (35%) have their main aquifers located within the weathered basement. Akanbi (2016) observed that sustainable groundwater supply is best guaranteed when the bedrock in basement region is fractured and there are good connections between the fractured rock and the weathered layer. According to Oladunjoye et al. (2019), groundwater yield in fractured basements is more productive than in weathered basements because they are more porous and permeable than weathered basements that consist of clay material.

Variability of Weathered Overburden and Implications on Groundwater Location

Table 2 shows the variability in lithology of the twenty (20) studied boreholes. The table revealed weathered and fractured rocks as the two main aquifer units in the study area. Studies such as Srinivasa et al. (2000), Chiton and Foster (1995), Wright (1992), Wright and Burgess (1992) have earlier identified joints, faults, fractures and weathered zones as sources of groundwater occurrence in areas underlain by basement complex rocks.

Table 2: Boreholes Logs for the Studied Wells

S/N	Borehole Location	No of Lithological Units Intersected	Nature of Lithological Units	Depth (m)	Colour	Remarks
1	Ojaoba	6	Loose Laterite Hard Laterite Basement Rock Fairly Weathered Rock Weathered Rock Basement Rock	5 6 29 5 5 3	Reddish Brown Reddish Brown	Dry Dry Dry Wet Water Zone
2	Budo Fulani	7	Loose Laterite Hard Laterite Sandy Clay Silt Basement Rock Basement Rock Fractured Basement	5 7 5 3 55 10 15	Reddish Brown Reddish Brown Yellow Ash Dry Wet Water Zone	Dry
3	Apata Yakuba	5	Loamy Soil Laterite Clay Basement Rock Weathered Basement	5 11 7 50.6 23.0	Brown Reddish Brown Yellow	Dry Dry Moist Dry Water Zone
4	Alalubosa	5	Loose Laterite Hard Laterite Basement Rock Fairly Weathered Basement Weathered Basement	5 5 30 10 8	Brownish Red	Dry Dry Dry Wet Water Zone
5	Ojatuntun	5	Loamy Soil Laterite Clay Hard Basement Weathered Basement	0.50 0.50 19.62 4.08 6	Brownish Red Red	Dry Dry Dry Dry Water Zone
6	Maternity	5	Top Loamy Soil Hard Laterite Hard Basement Rock	3 12 54	Brown Reddish Brown	Dry Dry Dry

S/N	Borehole Location	No of Lithological Units Intersected	Nature of Lithological Units	Depth (m)	Colour	Remarks
			Weathered Basement	10		Dry
			Weathered Basement	10		Water Zone
7	Ganmo	5	Top Loamy Soil	5		Dry
			Laterite	7	Brownish Red	Dry
			Silt	3	Red	Dry
			Basement Rock	1.25	Brownish	Dry
			Fractured Rock	10		Water Zone
8	Okaka	5	Top Loamy Soil	3		Dry
			Laterite	6	Brown	Dry
			Sandy Clay	2	Brownish	Dry
			Basement Rock	50	Yellow	Dry
			Fractured Basement	9		Water Zone
9	Gaa-Akanbi	6	Laterite	3		Dry
			Silt Clay	2	Brownish	Dry
			Hard Silty Rock	1	Brownish	Dry
			Basement Rock	9	Dark Brownish	Moist
			Basement Rock	9	Brownish	Moist and Wet
			Fracture Rock	6		Water Zone
10	Tanke Bubu	6	Laterite	5.7		Dry
			Clay	3		Moist
			Silt	9	Brown	Dry
			Weathered Rock	9	Brown	Dry
			Basement Rock	9		Dry
			Fractured Rock	5		Water Zone
11	Mandate/ Adewole	6	Clay	7		Dry
			Silt Clay	1.63		Dry
			Clay	2.9	Brownish	Moist
			Silt	8	Greenish	Moist
			Basement Rock	11.47	Dark	Dry
			Fractured/Weathered Rock	9		Water Zone
12	Oke-Andi	3	Top Loamy Soil	9.6	Brownish	Dry
			Basement Rock	47.6	Dry	Dry
			Fractured Rock	7.2		Water Zone
13	Fate Basin	4	Loamy Soil	1		Dry
			Clay	6	Dark	Dry
			Basement Rock	48	Reddish	Dry
			Fractured Rock	10		Water Zone
14	Zango	5	Loose Laterite	5		Dry
			Hard Laterite	6	Brownish	Dry
			Basement Rock	15	Brownish	Dry
			Weathered Basement	5		Wet
			Weathered Basement	7		Water Zone

S/N	Borehole Location	No of Lithological Units Intersected	Nature of Lithological Units	Depth (m)	Colour	Remarks
15	Sobi	5	Top loamy soil Loose Laterite Hard Laterite Basement Rock Fractured Basement	5 5 5 60 10	 Brownish Red Red 	Dry Dry Dry Dry Water Zone
16	Odota	6	Laterite Sandy Clay Weathered Basement Basement Rock Fracture Basement Fractured Basement	5 10 5 20 10 5	 Reddish Brownish 	Dry Dry Dry Dry Dry Water Zone
17	Balogun/ Fulani	5	Top Loamy Soil Sandy Clay Hard Basement Weathered Basement Fractured Basement	5 5 20 5 7	 Brownish Brownish 	Dry Dry Dry Wet Water Zone
18	Fufu	4	Laterite Clay Soil Basement Rock Fractured Basement	7.2 6.6 27.2 7.7	 Brownish 	Dry Dry Water Zone
19	Osere	4	Top Loamy Soil Clay Weathered Basement Basement Rock	0.50 27.8 5.2 1.50	 Dark Reddish 	Dry Moist Water Zone Water
20	Airport	5	Top Loamy Soil Laterite Silt Basement Rock Fractured Basement	1 4 1 85 9	 Brownish Brownish Red Ash 	Dry Dry Dry Dry Water Zone

Source: Archive of Lower Niger Basin Development Authority, Ilorin (2021)

The overburden in Oja Oba has a total depth of 11m with loose lateritic soil making up the first 5m depth followed by hard brownish red lateritic soil of 6m depth. Ground water in Oja Oba can only be accessed at a depth of 40m. Budo Fulani borehole has an overburden depth of 20m with loose lateritic soil making up the top 5m depth. Hard reddish brown laterite of 7m depth follows the lateritic layer before the occurrence of sandy clay and silt at the third and fourth layers of the lithology. Residents of Budo Fulani will need to dig more than 70m to access borehole water from fractured basement because of the nature of geology in the area.

While thickness of overburden of the borehole in Apata Yakuba represents almost a quarter (23.8%) of total borehole depth, substantial (82.8%) depth of the borehole in Alalubosa is made up of basement complex rock. The Alalubosa borehole contrast well with the borehole in New Market where depth of overburden represents almost 70% of the borehole depth. Groundwater from this particular borehole can be obtained from weathered basement lying at a depth of over 96m. The high depth of overburden in this particular borehole may be the reason why the aquifer is located within the weathered basement instead of the fractured basement.

Basement complex rocks make up 74m depth out of the 89m depth of the borehole in Maternity and 135m depth out of the 150m depth borehole in Ganmo. Residents of Ganmo may need to dig up to 140m to access groundwater because of the nature of lithology which is neither weathered nor fractured to a great depth. The depth of overburden and depth to water table at Okaka are 11 and 61m respectively. Two lenses of aquifer can be found in boreholes located in Apata Yakuba, Tanke Bubu and Adewole areas of the city with the first aquifer in all the three boreholes located in the saprolitic layer made up of clay material while the second aquifer in all the three wells can be found at deeper locations in the fractured bedrock.

Borehole in Oke Andi has the least number of lithological units of three. Water in this borehole can be accessed from the aquifer located at 57.2m depth in the fractured rock. Groundwater in Fate Basin can be accessed in fractured rock located at 48m depth below the 7m depth of overburden. Although the boreholes located in Zango and Sobi areas of the city intersected six lithological units each, the depth of overburden in Zango when compared to that of Sobi is shallow and the depth to water table in Sobi is more than twice the value of depth to water table in Zango.

Odota borehole intersected six lithological units with two layers of fractured zone. While the first fractured zone which is found between 41 and 50m depth is dry, the aquifer in this particular borehole can be found in the second fractured zone which commences at 51m depth.

Shapiro et al. (1999) have earlier revealed that water availability in fractured rock terrain can be spatially and vertically variable to the extent of ranging over several orders of magnitude among lithologies and over relatively short distances due to heterogeneous fracture distribution and variable degrees of interconnectivity between the structural features. Although the boreholes in Balogun Fulani and Fufu intersected five and four lithological units respectively, the aquifers in the two boreholes can be found within the fractured basements located at 31 and 41m depth respectively. While the

presence of water can be felt at less than 1m depth in the borehole located at Osere, depth to water in the borehole located at the Airport is 91m. Fig. 3 shows the downhole lithological logs of the studied boreholes.

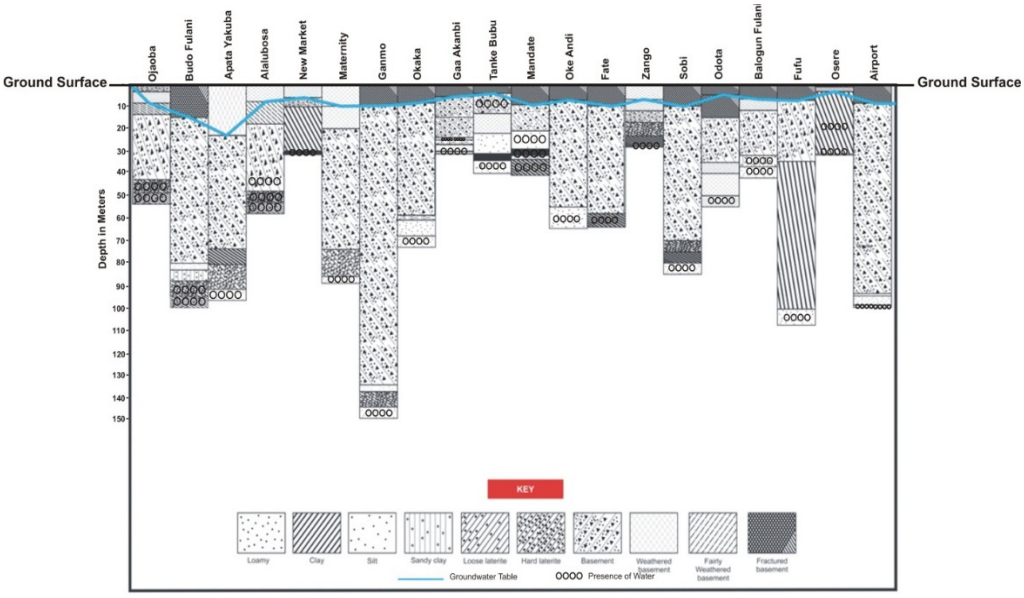

Fig. 3. Downhole Lithological Logs of Studied Boreholes**.**
Source: Author's Finding (2021)

Inter-relationship between Lithology, Topography and Hydrology in the Studied Boreholes

Explanation of the hydrology of fractured rock terrains according to Bailey et al. (2018) remains one of the most challenging and complex problems in water resources management and development, and this is because of the structural complexities of aquifer in such regions (Moore et al., 2020). Attempt at explaining the hydrology of the study area towards ameliorating problems induced by increasing water demand calls for the understanding of the inter-relationships between lithology, topography and hydrology in the study area (table 3). This effort will not only help groundwater prospecting activity in the study area but will also assist in the promotion of sustainable groundwater development in similar geological regions.

Table 3. Inter-relationship between Hydrological, Topographical and Lithological Parameters

	No. of Lithological Units	Depth of Saprolite	Depth to Water table	Topographic Elevation	Borehole Depth
Number of Lithological Units	1				
Depth of Saprolite	0.065	1			
Depth to Water table	0.277	-0.069	1		
Topographic Elevation	-0.575	-0.310	0.498*	1	
Borehole Depth	0.296	-0.055	0.992	0.534*	1

*Correlation Significant at 0.05 Level
Source: Author's Finding (2021)

The matrix (table 3) revealed a strong correlation value ($r > \pm 0.7$) only in one relationship i.e. between borehole depth and depth to water table ($r= 0.992$). However, two of the relationships, i.e. between topographic height and depth to water table ($r= 0.498$) and between topographic height and borehole depth ($r= 0.534$) are statistically significant at 0.05 confidence level. These two relationships thus show that the higher the topographic height, the deeper the depth to water and the deeper the borehole depth.

The positive relationship between topographic height and depth to water is understandable; topography affects groundwater through slope exposure (Grinevsky, 2014). Higher slope areas discourage infiltration process by generating quick runoff. High relief areas thus offer little volume of water for groundwater recharge; hence the statistically positive significant relationship between topographical height and depth to water table.

The positive relationship between topographic height and borehole depth is expected. Borehole depth in this study is strongly correlated positively with depth to water table. The fact that water table is positively correlated with topographic height, borehole depth is thus positively correlated with topographic height. Studies such as Akanbi (2018), Plummer and Carlson (2008), Marklund and Worman (2007), Condon and Maxwell (2015), Devito et al. (2005), Wolock et al. (2004) and Hatjema and Mitchell-Bruker (2005) have all identified topography as one of the factors that determine groundwater configuration.

The weak negative correlation ($r = -0.069$) between depth of regolith and depth to water table shows that depth to water table in areas with deep depth of regolith are high while depth to water table in thin regolith are low. This result is expected; the deeper the regolith, the greater is the ability to store water and the higher the water table. Studies such as Olaniyan et al.

(2010), Ifabiyi et al. (2016), Akanbi (2017), Adelana et al. (2008) and Wright (1992) have linked borehole productivity in basement complex regions to thickness of regolith.

The weak inverse relationship (r = -0.069) between depth of saprolite and depth to water table mean that the thicker the depth of weathered regolith, the lower the water table. This finding is understandable; though the weathered regolith is highly permeable, it is also highly porous. Thus infiltrated water into thick regolith will continue to percolate into either fractured or weathered rock below.

CONCLUSION

The study has related down-hole lithographic variation with water bearing capacity of some boreholes in Ilorin, Nigeria. Although the weathering profile of the studied area can broadly be classified into three layers of top soil, saprolite and bed rock, nine lithological units were identified in the studied boreholes. Three of the investigated boreholes have two aquifers lenses each (minor and major) while the remaining seventeen have one aquifer lens each. The minor lens in each of the three boreholes with two aquifer lenses are located in lithological units composed of clay material found within the saprolite. The main aquifer in most of the boreholes is located within the fractured basement while only few of the boreholes have their main aquifer located within the weathered basement. Statistical evaluation shows that topographic height is of great significance in influencing water table in the study area.

REFERENCES

1. Adelana, S.M.A, Olasehinde, P.I., Bale, R.B., Vrbka, P., Edet, A.E and Goni, I.B. (2008), *An Overview of Geology and Hydrogeology of Nigeria*, Applied Groundwater Studies in Africa, 171-197.
2. Adelana, S.M.A and Olasehinde, P.I. (2004), *Characteristics of Groundwater Flow in the Fractured/Weathered Hard Rock using Hydro-geochemical and Isotopic Investigations*, Proc XXXIII Conference of International Association of Hydrogeologists Mexico, 11-15.
3. Aderibigbe, S.A, Awoyemi, A.O. and Oshagbemi, G.K. (2008), *Availability, Adequacy and Quality of Water Supply in Ilorin Metropolis, Nigeria*, European Journal of Scientific Research 23 (4), 528-536.

4. Admimalla, N. (2020), *Controlling Factors and Mechanism of Groundwater Quality Variation in Semiarid Region of South India: An Approach of Water Quality Index (WQI) and Health Risk Assessment (HRA)*, Environ. Geochem. Health 42, 725-752 doi: 10:1067/510653-019-00374-8.
5. Akanbi, O.A. (2016), *Use of Vertical Electrical Geophysical Method for Spatial Characterization of Groundwater Potential of Crystalline Crust of Igboora Area, Southwestern Nigeria*, Int.J.Sci Res Publ. 6 (3), 399-406.
6. Akanbi, O.A (2018), *Hydrogeological Characterization and Prospect of Basement Aquifers of Ibarapa Region, Southwestern Nigeria*, Applied Water Science 8 (89), 1-22 https://doi.org/10.1007/s13201-018-0731-9.
7. Andres, L., Chellaraj, G., Gupta, B.D., Grabinsky, J. and Joseph, J. (2018), *Why Are So Many Water Points in Nigeria None-Functional? An Empirical Analysis of Contributing Factors*, Policy Research Working Paper, 8388.
8. Areola, O.O. (1978), *Soil and Vegetal Resources*, in: Oguntoyinbo, J.O., Areola, O.O. and Filani, M. (eds.) *A Geography of Nigeria Development*, Heinemann Educational Books Ltd., Ibadan.
9. Azeez, L.O. (1972), *Rural Water Supply in the Basement Complex Area of Western States*, Nigeria Bulletin, IASH 17 (1), 97-110.
10. Bailey, B., Dripps, W. and Muthukrishnan, S. (2018), *Spatial Analysis of Hydrological Productivity in Fractured Bedrock Terrain of the Piedmont of Northwestern South Carolina*, Journal of South Carolina Water Resources, 5 (1), 25-33.
11. Carrad, N., Foster, T., and Willets, J. (2019), *Groundwater as a Source of Drinking Water in Southeast Asia and the Pacific: A Multi Country Review of Current Reliance and Resource Concerns*, Water 11, 1065-11-21 doi 10.3390/W11081605.
12. Carrier, M.A, Lefebvre, R, Racicot, J., and Asare, B. (2008), *Northern Ghana Hydrogeological Assessment Project*, Proceedings of 33rd WEDC International Conference, Accra, Ghana, 13-21.
13. Chilton, P.J and Foster, S.D (1995), *Hydrogeological Characterization and Water Supply Potential of Basement Aquifers in Tropical Africa*, Hydrogeology Journal, 3 (1), 36-49.
14. Clark, L. (1985), *Groundwater Abstraction from Basement Complex Areas of Africa*, Journal of Engineering Geology, 18, 25-34.
15. Condon, L.E. and Maxwell, R.M (2015), *Evaluating the Relationship between Topography and Groundwater using Outputs from a Continental-Scale Integrated Hydrology Model*, Water Resources Research, 51, 6603-6621, doi: 10.1002/2014WR016774.
16. Devito, K.I, Creed, T., Gan, C., Mendoza, R., Petrone, U., Silins, R. and Smerdon, B. (2005), *A Framework for Broad Scale Classification of Hydrologic Response Units on the Boreal Plain: Is Topography the Last Thing to Consider?*, Hydrol. Processes, 19, 1705-1714, doi: 10.1002/hyp.5881.
17. Gillespie, M.R, Barnes, R.P. and Milodowski, A.E. (2011), *British Geological Survey Scheme for Classifying Discontinuities and Fillings*, British Geological Survey Research Report RR/10/05, 56 p.
18. Grinevsky, S.O. (2014), *Effect of Topography on the Formation of Groundwater Recharge*, Moscow University Geology Bulletin, 69 (1), 47-52.

19. Guppy, L., Uyttendaele, P., Villholth, K.G and Smakhtin, V. (2018), *Groundwater and sustainable Development Goals; Analysis of Inter linkages*, UNU-INWEH Report series issue of Institute for Water Environment and Health United Nations University, Hamilton, ON, Canada.
20. Gustafson, G. and Krasny, J. (1994), *Crystalline Rock Aquifers: Their Occurrence, Use and Importance*, Applied Hydrogeology, 2, 64-75.
21. Hatjema, H.M. and Mitchell-Bruker, S. (2005), *Are Water Tables a Subdued Replica of the Topography?*, Groundwater, 43 (6), 781-786, doi: 10.1111/j. 1745-6584.2005.00090.X.
22. Ifabiyi, I.P and Asaolu, E.D. (2013), *Analysis of the Impacts of Rainfall Variability on Public Water Supply in Ilorin, Nigeria*, Journal of Meteorology and Climate Science, 11 (1), 18-26.
23. Ifabiyi, I.P., Ashaolu, E.D. and Omotosho, O. (2016), *Hydrogeological Characteristics of Groundwater Yield in Shallow Wells of the Regolith Aquifer: A Case study from Ilorin, Nigeria*, Momona Ethiopian Journal of Science, 8 (1), 23-36.
24. Ijaiya, G.T. (2000), *Impact of Water Shortage and Depletion on the Productive Time of Women in Ilorin Metropolis: A Pilot Survey*, Journal of Environment and Policy Issues, 1 (1&2), 38-45.
25. Kouassi, A.M., Coulibaly, D., Koffi, Y.B. and Biemi, J. (2013), *Application of Geophysical Methods to the Study of the Productivity of Water Drilling in Crystalline Aquifers: Case Study of the Toumodi Region (Central Cote d'Ivoire)*, International Journal of Innovation and Applied Studies, 2, 324-334, http://www.issr-journals.org/ijias.
26. Koyame, B.K., Douagui, A.G., Kouame, I.K., Yeo, E.W. and Savane, I. (2019), *Borehole Productivity Controlling Factors in Crystalline Bedrock Aquifer of Gkbeke Region, Center of Cote d'Ivoire*, Journal of Water Resources and Protection, 11 (6), 728-739. Doi:10.4236/jwarp.2019.116043.
27. LeGrand, H.E. (1989), *A Conceptual Model of Groundwater Setting in the Piedmont Region*, in: Daniel C.C III, White, R.K and Stone, P.A (eds.), *Groundwater in the Piedmont*, Proceedings of Conference on Groundwater in the Piedmont of the Eastern United States, Clemson University, 317-327.
28. Maity, D.K and Mandal, S. (2019), *Identification of Groundwater Potential Zones of the Kumari River Basin, India: As RS and GIS Based Semi-Quantitative Approach*, Environ. Dev Sustain., 21, 1013-1034, 10.1007/510668-017-0072-0.
29. Margat, J.V. (2013), *Groundwater Around the World; A Geographic Synopsis*, CRC Press, Taylor and Francis Group, USA, 376 p.
30. Marklund, L. and Worman, A. (2007), *The Impact of Hydraulic Conductivity on Topography Driven Groundwater Flow*, Publ. Inst. Geophysc. Polish Acad.Sci., 7 (401), 159-167.
31. Monroe, J.S. and Wicander, R. (2005), *Physical Geology*, 5th Edition, Thomson Learning Inc., USA, 644 p.
32. Moore, R.M., Schwarz, G.E., Clark, S.F.Jr., Walsh, G.J. and Degnan, J.R. (2002), *Factors Related to Well Yield in Fractured-Bedrock Aquifer of New Hampshire*, U.S. Geological Survey Professional Paper 1660, Denver.

33. Nyagwambo, N.L. (2006), *Groundwater Recharge Estimation and Water Resources Assessment in a Tropical Crystalline Aquifer*, unpublished Ph.D. Thesis, Delft University of Technology, Netherlands, 182 p.
34. Okeola, O.G and Salami, A.W. (2014), *Groundwater Resources in the Nigerian's Quest for United Nations Millennium Development Goals (MDGs) and Beyond*, Journal of Sustainable Development in Africa, 16 (4), 57-71.
35. Oladunjoye, M.A, Korede, I.A and Adefehinti, A. (2019), *Geoelectrical Exploration for Groundwater in Crystalline Basement Rocks of Gbongudu Community, Ibadan, Southwestern Nigeria*, Global Journal of Geological Sciences, 17, 25-43.
36. Olaniran, O.J. (2002), *Rainfall Anomalies in Nigeria: The Contemporary Understanding*, 55th Inaugural Lecture, University of Ilorin, 66 p.
37. Olaniyan, I.O, Agunwamba, J.C and Ademiluyi, J.O. (2010), *Lithologic Characteristics of Parts of the Crystalline Basement Complex of Northern Nigeria in Relation to Groundwater Exploitation*, Journal of Engineering and Applied Sciences, 6 (7), 9-14.
38. Oluyide, P.O., Nwajide, C.S. and Oni, A. (1998), *The Geology of Ilorin Area with Explanations, the 1:250,000 Series, Sheet 50*, Ilorin Geological Survey of Nigeria Bulletin 42, 1-84.
39. Oyegun, R.O. (1983), *Water Resources in Kwara State, Nigeria*, Matanmi and Sons Printings and Publishing Ltd., Ilorin, 113 p.
40. Pande, C.B., Moharir, K.N., Singh, S.K. and Varade, A.M. (2019), *An Integrated Approach to Delineate the Groundwater Potential Zones in Devdari Watershed Area of Akola District, Maharashtra, Central India*, Environ. Dev. Sustain., 22, 4867-4887, doi: 10.1007/510668-019-00409-1.
41. Parameswari, K. and Padmini, T.K. (2018), *Assessment of Groundwater Potential in Tirukalu Kundram Block of Southern Chennai Metropolitan Area*, Environ. Dev. Sustain., 20, 9-18, doi:10.1007/s10668-017-9952-6.
42. Plummer, C.C. and Carlson, D.H. (2008), *Physical Geology*, 12th Edition, McGraw Hill Companies, USA, 651 p.
43. Shapiro, A.M., Hsieh, P.A., Haeni, G.P. (1999), *Integrating Multidisciplinary Investigations in the Characterization of Fractured Rock*, in: Morganwalp, D.W., Buxton, H.T. (eds.), *Toxic Substance Hydrology Program*, 3 (3), 660-680.
44. Srinivasa, R.Y., Reddy, T.V.K and Nayudu, P.T. (2000), *Groundwater Targeting in a Hard Rock Terrain using Fracture Pattern Modelling, Niva River Basin, Andr, Pradesh, India*, Hydrogeology Journal, 8 (5), 494-502.
45. Sule, B.F., Agunbiade, M., Adeogun, A.G. and Ihagh, G. (2016), *Small Town Water Supply: Situational Assessment of Shao, Kwara State*, Nigeria Journal of Mechanical and Civil Engineering, 13 (4), 48-53.
46. Tadesse, N. (2017), *Lithological and Structural Controls on the Development of Aquifer in Basement Rock Dominated Tsalit-Ira River Basin Tigray, Northern Ethiopia*, Monona Ethiopian Journal of Science, 9 (1), 106-126.
47. Veils, M., Conti, K.I and Biermann, F. (2017), *Groundwater and Human Development: Synergies and Trade –Offs within the Context of the Sustainable Development Goals*, Sustain.Sci, 12, 1007-1017.

48. Wijesekera, A.G.N. (1984), *Hydrogeological Studies in the Hard Rock Areas of Sri-Lanka*, in: *Special Papers, National Water Supply and Drainage Board and WHO Case Studies on Hydrogeological Investigation in Hard Rock Areas of Sri-Lanka*, 28-36.
49. Williams, L.J., Kath, R.L., Crawford, T.J. and Chapman, M.J. (2014), *Influence of Geologic Setting on Groundwater Availability in the Lawrenceville Area, Gwinnett Country, Georgia*, US Geological Survey Report.
50. Williams, M.R., Buda, A.R., Elliot, H.A., Hamlett, J., Boyer, E.W. and Schmidt, J.P. (2014), *Groundwater Flow Path Dynamics and Nitrogen Transport Potential in the Riparian Zone of an Agricultural Headwater Catchment*, Journal of Hydrology, 511, 870-879.
51. Wolock, D.M., Winter, T.C. and McMahon, G. (2004), *Delineation and Evaluation of Hydrologic-Landscape Region in the United States using GIS Tools and Multivariate Statistical Analysis*, Environ.Manage., 34 (1), 571-588 doi:10.1007/500267-003-5077-9.
52. World Bank (2017), *Sustainability Assessment of Rural Water Service Delivery Models; Findings of a Multi-Country Review*, World Bank Report, Washington DC, USA.
53. Wright, E.P. (1992), *The Hydrogeology of Crystalline Basement Aquifers in Africa*, in Wright, E.P. and Burgess, W.G. (eds), *The Hydrogeology of Crystalline Basement Aquifers in Africa*, Special Publication no. 66, Geological Society, London, pp. 1-27.

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FIRES IN THE WASTE MANAGEMENT SECTOR IN ROMANIA. FREQUENCY, CAUSES AND SPATIAL DISTRIBUTION

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ABSTRACT. – Fires in the Waste Management Sector in Romania. Frequency, Causes and Spatial Distribution. Large waste fires are severe hazards to the human health and to the environment due to the sudden release of pollutants they imply. In this study we take a first step towards a better understanding of this phenomenon in Romania by creating and analyzing a waste fire database. Starting from a public data set regarding firefighting interventions in the waste management sector between 2016 and 2020, we have identified three main types of fires – fires at the municipal waste collection points, surface waste fires and fires at waste recycling facilities. We further calculated the frequency of these fires, identified their causes, and their spatial distribution.

Keywords: *waste fires, health, hazard, persistent organic pollutants, fire causes.*

1. INTRODUCTION

The waste management sector has to deal with several types of environmental challenges on a daily basis (e.g., landfill gas emissions, soil contamination, pollution of groundwater by landfill leachate, etc.); in addition, inadvertent events, such as fires, often require interventions. Large waste fires suddenly release big quantities of greenhouse gases and pollutants and represent severe hazards for the environment and human health. Bihałowicz *et al* (2021) estimated that for 79 large waste fires occurring in 2018 in Poland the emission of PM_{10} represented more than 2% of the national emissions, being almost equal to the emissions of the entire transport sector in the Warsaw agglomeration in a year. Moreover, the authors calculated that waste fires emitted the same amount of CO_2 that would have been released during 75 years of waste storage in landfills.

Alongside these substantial but rather infrequent events, there is the widespread practice of burning waste on a regular basis, as a means of waste disposal, especially in developing countries, contributing to a slow and insidious

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environmental pollution (Ferronato and Torretta, 2019; IPEN, 2021). However, the backyard burning of waste and setting dumpsites on fire, while less frequent, is still present in the US and EU as well (Muñoz and Panero, 2006; Mihai *et al*, 2019; Buzzo *et al*, 2021), requiring burning bans and other measures in order to curb these practices (e.g., EC, 2009; WDHS, 2015).

The fires release pollutants already present in the burning materials, while, at the same time contributing to the emission of new ones: polycyclic aromatic hydrocarbons (PAHs), dioxins, and furans, among others. PAHs result from burning carbon-containing compounds; dioxins and furans result from the combustion of carbon-containing materials in the presence of chlorine or other halogens. They are persistent organic pollutants (POPs) that are able to bind to the fat cells in the animal and human body and tend to persist into the environment and into the animal tissues for long periods (Tuomisto, 2019). Many combustion processes release various quantities of those chemicals, but in the cases of open burning of waste and accidental waste fires, the rather low temperature of the fire, the poor ventilation/low oxygen supply and the high diversity of materials that serve as fuel represent the main factors that contribute to a higher release of pollutants than it would result in the process of controlled combustion (e.g., in regulated industrial processes and proper waste incinerators). Estimated emissions show that the open burning of one kilogram of waste may cause the same amount of dioxin emission as ten tons of waste burned in a modern waste incinerator (EC, 2009).

While dioxin reducing measures imposed to the industry in Europe and US greatly contributed to decreasing the environmental pollution in the last forty years (Tuomisto, 2019; BMU, 2021), other unaddressed combustion processes have become the main source of such chemicals. A dioxin inventory for the New York Harbor area estimated that uncontrolled burning (mainly backyard burning, structural fires and fires during solid waste management) was responsible for two thirds of all dioxin emissions into the air, and half the dioxin contained in ash residues (Muñoz and Panero, 2006). In Germany, fires were responsible for 44.5% of all dioxin emissions in 2018 (BMU, 2021), while in Canada, the open burning of residential waste produces more dioxins and dioxin-like chemicals than all the industrial activities combined (Government of Canada, 2015).

Because of the potentially heavy impact waste fires have on the environment and on human health, environmental experts and organizations (e.g., EPA, 2003; Muñoz and Panero, 2006; EC, 2009; WDHS, 2015; IPEN, 2021, etc.) have listed waste fire prevention and banning the domestic waste burning as important measures for reducing pollution with POPs. In the present study we take a snapshot of fires in the waste management sector in Romania. Our objectives are to understand how frequent they are, what are their main causes and what is their spatial distribution.

2. MATERIALS AND METHODS

2.1 Waste fires database

We used data form the Romanian Inspectorate for Emergency Situations (Inspectoratul General pentru Situaţii de Urgenţă/IGSU) in order to create a waste fires database. The dataset received from IGSU listed the interventions carried out by the firefight departments upon fires occurring in the waste management sector during the 2016-2020 period (the date and duration of the intervention, the county in which the intervention took place, the determining circumstance of the fire and a short description of the intervention, that in many cases provided details about the type and quantity of burnt waste and the fire-affected area). In this five-year period, there were 3039 firefighters' interventions upon fires occurring in waste management sector. Comparing this to the yearly average number of interventions upon all fires, this seems like a very small figure (around 30000 interventions/year upon all types of fires and only around 600 interventions/year upon waste fires). Because the dataset contains firefighters' interventions, not fire events, in the case of large fires more interventions were recorded, even if it was still only one fire event (if several fire crews were involved in extinguishing it). Based on intervention dates and descriptions we created a waste fires database by assigning the identified multiple firefighters' interventions to the same fire, to a single fire event. Another database resulted, showing 2707 fires occurring at waste management facilities or involving waste burning between 2016 and 2020.

2.2 Database analysis

Based on the description of the firefighters' interventions, we classified the fires into three main categories: *fires at municipal waste collection points, surface waste fires and fires at waste recycling facilities*. The category referring to fires at municipal waste collection points resulted from descriptions of dumpster, waste bins and recycling containers fires. In many cases, other items were damaged, such as street furniture (benches, streetlights), small constructions enclosing the waste collection points, cars parked nearby, fences, and walls of the buildings located nearby the waste collection points. Surface waste fires refer to open burning of waste on small or large areas such as waste and vegetation fires, dumpsites and landfill fires. Fires at waste recycling facilities usually involve big quantities of recycling waste (paper and cardboard, plastic, textiles, metal waste, hazardous and industrial waste, waste from electrical and electronic equipment/WEEE) deposited in piles, baled, or stored in containers.

Fires occurring at facilities collecting and recycling end-of-life vehicles (scrap yards) are also included in this category. Sometimes halls and other buildings, machineries and vehicles were damaged or have been burned down in this kind of fires.

We further calculated fire frequency by the above-described categories in every county in Romania and identified the cause of each fire (based on the description of the determining circumstance in the firefighters' reports). The main causes were defined as: *intentional burning* (mainly "intentional use of an ignition source to start the fire", but also "intentional or fault creation of fire conditions", "children playing with fire", etc.), *open burning* ("open fire in open areas"), *smoking* (mostly "smoking in restricted areas or in places not properly secured against potential fire"), *self-ignition* (mostly "self-ignition by contact with the air or the oxygen", "self-ignition of mixed-substances", self-ignition as a consequence of poor ventilation, etc., and in several occasions, "accumulated, concentrated or reflected solar heat" or other natural phenomena), *malfunctioning devices or improper use of equipment* (faulty appliances, electrical tools and machineries, inadequate use of such items, sparks, defective electrical cables or electrical installations, etc.), and *other causes* ("hot ashes and ember", "open fire in closed areas", etc. and in cases in which the determining circumstances of the fires were not specified).

3. RESULTS AND DISCUSSION

3.1 Fires at municipal waste collection points

Most of the fires reported in the waste management sector in Romania occurred at municipal waste collection points (2056 fires). The public IGSU dataset does not report the exact location of the firefighter's interventions; however, we assume most of those fires occurred in urban areas, where municipal waste collection is better implemented and where public firefighting departments function to respond to such fire alarms. We can note that many fires occurred in more urbanized areas such as Bucureşti-Ilfov (321 fires), Cluj County (130), Timiş County (107), etc.

The majority of these fires started from "smoking in restricted areas or in places not properly secured against potential fire" (most probably because lit matches and cigarettes were discarded in waste containers). Other frequent causes were intentional burning and open burning (fig. 1).

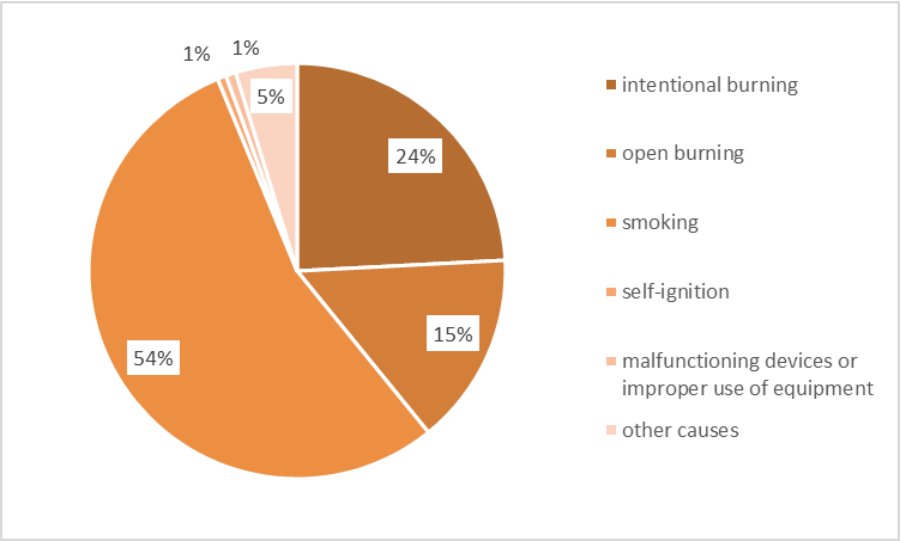

Fig. 1. Main causes of fires at municipal waste collecting points in Romania.
Source: own calculation based on data from IGSU

In terms of environmental impacts, we can compare these fires to open burning of waste in barrels (especially if the waste was collected in metal containers). Several studies reviewed by Costner (2006) have shown that the incomplete combustion of household waste (because of low air flow) in the presence of metals hugely increases the emissions of dioxins and dioxins-like compounds. Also, as many of the waste containers are made of plastic and they burn together with the waste in the fire, this contributes to the releasing of increasing amounts of PM10 and PAHs into the air (Hoffer *et al*, 2020). Moreover, extinguishing fires with water and foam contributes to the local pollution with ashes and chemicals that washes away from the fire site and accumulates in soil and wastewater, and further in groundwater and rivers.

3.2 Surface waste fires

The burned materials in surface waste fires usually are household waste, textile waste, voluminous waste (furniture, used mattresses etc.), used tires, that can often be found in informal dumpsites or abandoned on public space, but also waste and vegetation on large areas, and municipal waste at sanitary landfills. Between 2016 and 2020, 518 such fires happened, averaging 104 fires/year. Most of them occurred in the București-Ilfov area (184 fires), Cluj County (40), Mureș County (38), Suceava County (25), Galați County (26) and Giurgiu County (24). 27 out of the 41 counties in Romania recorded less than 10 surface waste fires in the analyzed period.

Almost half of the surface waste fires were caused by open burning and intentional burning (fig. 2). Since not all the rural communities in Romania are located in areas covered by waste collecting services, the open dumping and open burning of the waste is still a widespread practice (see, for example, Mihai *et al,* 2019); this behavior may explain the high number of fires intentionally started by people. Other 32% of the fires in this category were started non-intentionally, by smoking-related actions, and 14% of them were caused by self-ignition; we assume those were landfills fires. The high content of organic matter in the residual waste in Romania (according to PNGD, biowaste represents more than 50% of the collected municipal waste) contributes to the accumulation of landfill gases (mostly methane), and the combustible materials such as plastic, papers and textiles supply the fire with more fuel. Another explanation for the self-ignition of fires in landfills can be an incomplete extinguishing of a previous fire that reignites (Mikalsen *et al.*, 2021). This latter supposition may be supported by the presence of series of fires at the same landfill in short periods of times (e.g., 10 fires at the Cluj-Napoca landfill in July 2017, 8 fires at the Sighișoara landfill in September 2019).

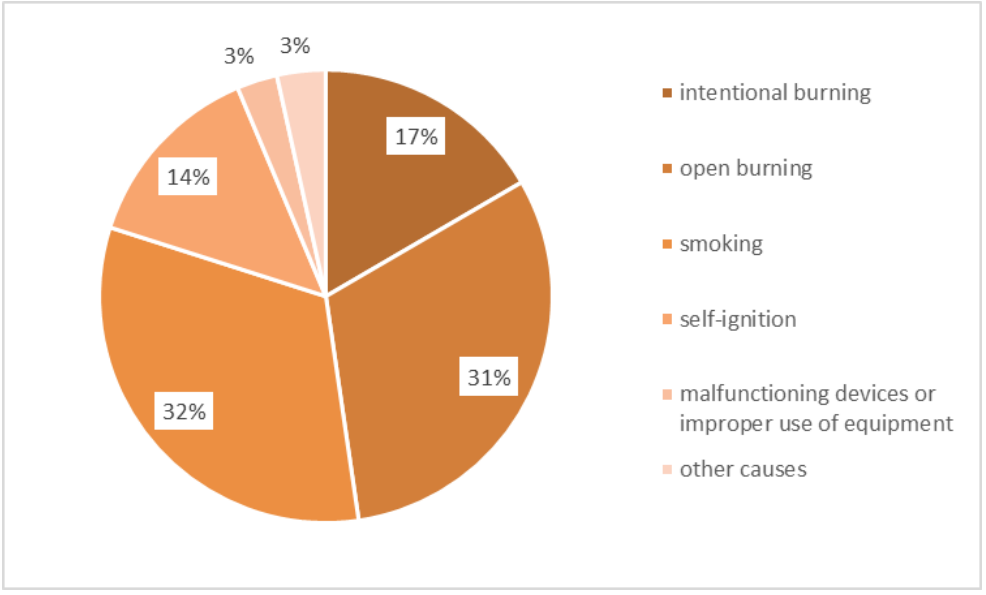

Fig. 2. Main causes of surface waste fires in Romania.
Source: own calculation based on data from IGSU

Out of the 518 surface waste fires, more than a quarter (135 fires) was represented by fires in which waste and vegetation burnt together. In these cases, it is not clear which one was the first, the waste fire or the dry vegetation

fire. However, in the cases in which the firefighters' reports describe areas of tens to hundreds square meters of burnt vegetation, one can assume it was a waste fire that propagated to the vegetation nearby – most of the waste and vegetation fires in the database are in this category (90 fires). However, there were 45 cases in which the fires affected thousands of square meters or even hectares of vegetation. The presence of such large vegetation areas suggests these fires occurred in more rural landscapes and that they were either vegetation fires that also burnt small quantities of waste, either landfill fires, if the amount of burnt waste was estimated in tons.

In several cases, the fire reports listed mostly electrical cables (8 fires) and used tires (25 fires) as burnt materials. The plastic coating of several types of electrical cables is made of PVC (polyvinyl chloride), a type of plastic with a high content of chlorine. With the added metal core of the cables, a harmful combination results, with a very high dioxin and PAHs production potential when burnt (Costner, 2006; Blomqvist *et al*, 2012), that leads to lasting contamination of soil with POPs. We can observe in our database a high spatial concentration of fires in which electrical cables were burnt in the Bucureşti-Ilfov area (seven out of the eight such fires reported, the other one being in the adjacent county, Giurgiu). The media and several NGOs have been documenting these issues for many years now, describing how an informal recycling sector has been growing around Bucharest, contributing to increasing air pollution into the city and to persistent environmental pollution in the nearby rural areas (Ignat, 2013; Ilie, 2021).

The tire fires are also harmful for the environment and human health. A study on a large tire fire in Lithuania has revealed very high quantities of PAHs and other pollutants, released into the air and into the soil, up to 10 km in the surrounding areas, away from the fire site (Raudonytė-Svirbutavičienė *et al*, 2022). However, the tire fires that occurred in the analyzed period in Romania were much smaller than the one described in the cited study – the largest of them involving around 100 used tires each (a fire on the 20th of December 2017 in Mehedinţi County and another one on 3rd of September, 2019 in Mureş County), so one can assume the contamination was moderate and limited to the exact fire site.

3.3 Fires at waste recycling facilities

During the 2016-2020 period, 133 fires occurred at waste recycling facilities. The areas that were most affected by this type of fire were the Bucureşti-Ilfov area (26), Prahova County (11) and Galaţi County (10). The most impactful in terms of environment pollution are large WEEE fires. During the analyzed period, we identified four such fires, the largest one, in Dâmboviţa County involving 15 tons of WEEE. The high content of plastic and metals in

these kinds of waste produces large amounts of POPs when burnt. IPEN (2021) analyzed the dioxin content of the eggs collected from free range chickens living in areas near landfills and dumpsites catching fire frequently (located mostly in Asia and Africa). The eggs collected nearby dumpsites and landfills containing WEEE waste had the highest dioxin content of all the analyzed samples – eating half an egg from such a site would result in exceeding the tolerable dietary intake for dioxins by 12-fold to 149-fold (IPEN, 2021, p. 72).

Fires at facilities collecting and recycling end-of-life vehicles are equally dangerous because of the diverse type of materials involved: metal, rubber, plastic, textile (usually with high content of plastic and fire-retardant treatment) and various hazardous wastes such oils, batteries etc., that make a very pollutant mix when burnt together (McNamee *et al,* 2019). Between 2016 and 2020 there were 35 fires at facilities collecting and recycling end-of-life vehicles. The largest one occurred in the Bucuresti-Ilfov area, on September 1st, 2016 – 300 vehicles burnt in the fire, on a 1000m^2 area and on a height of four meters. Sometimes these kind of waste recycling facilities are located in densely populated areas, in which case, a fire is a direct threat to the safety and health of the population living nearby - it was the case of a scrap yard fire in Bucharest on the 5th of June 2021 that required the evacuation of 70 people (Oprea, 2021).

Fires at facilities collecting hazardous waste are fewer (11 cases in our database). A probable reason is the fact that there are fewer such facilities than those dealing with non-hazardous waste and, as Mikalsen *et al* (2021) found, because better fire prevention measures are implemented at these sites. Based on the frequency of fires in waste facilities in the Scandinavian countries and of the potential economic and environmental consequences of those fires, the cited authors classified waste fractions in terms of fire risk. According to them, the greatest fire risk is associated to residual waste because of the higher frequency of fires on that kind of waste and of the many possible consequences of those fires (usually large quantities of burning waste, damaged equipment and machineries, increased pollutants emission due to the heterogeneous composition of the waste). WEEE was ranked second in terms of fire risk, paper and cardboard third and hazardous waste forth. Despite the possible greater impact on the environment of hazardous waste fires, their low frequency contributes to a lower overall risk.

In Romania, fires at waste recycling facilities are caused mainly by the inappropriate usage of tools, machineries, and appliances, by sparks generated while using cutting and metal welding tools, by faulty or improvised electrical installations, etc. (fig. 3). Another frequent cause is self-ignition (17% of fires) – mostly by creating conditions favourable for a fire by the inappropriate storage of the waste. Also, smoking was responsible for 14% of the fires in this waste management sector.

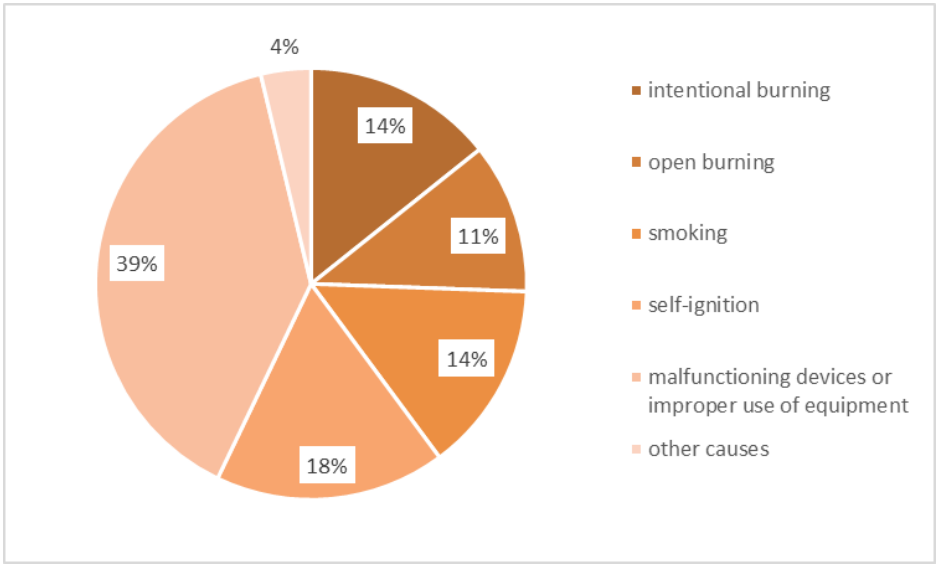

Fig. 3. Main causes of fires at waste recycling facilities in Romania.
Source: own calculation based on data from IGSU

4. CONCLUSIONS

The contribution of the waste management sector to greenhouse gas emission and to environmental pollution has been getting much attention from the scientific community. However, the part that waste fires play in this is not very well known yet. Making estimates is hard because of the accidental manner in which these events happen and because of the unique characteristics of every fire. That is why a database containing fires, such as the one we produced, is a necessary starting point for understanding the magnitude of the phenomenon. Further research is needed in order to assess the impact of waste fires upon the environment and human health in Romania, especially in places where large fires are recurrent events, such as in the Bucureşti-Ilfov area, and in several counties - Cluj, Mureş, Suceava, Giurgiu, Galaţi, Prahova.

While usually small, frequent fires taking place at municipal waste collecting points pollute the air and may affect human health. Preventing them could be an easy way of reducing urban pollution. Since smoking is the leading cause for fires at municipal waste collecting points, public awareness campaigns on the fire risks of smoking may be sensible actions that local authorities could implement.

The open burning of waste is another important cause for waste fires in Romania, especially in rural areas. Enforcing the existing burning bans and awareness campaign could work in this case too in order to decrease the frequency of surface waste fires. However, a functional waste collecting system needs to be put in place first.

Malfunctioning devices or improper use of equipment have been the leading causes for fires in waste recycling facilities in Romania. This suggests that a better fire prevention is needed, especially in recycling facilities dealing with WEEE and end-of-life vehicles, where a fire would have a much greater potential for harmful emissions than in other waste management sector areas.

REFERENCES

1. Bihałowicz, J. S., Rogula-Kozłowska, W., Krasuski, A. (2021), *Contribution of landfill fires to air pollution – An assessment methodology*, Waste Management 125, 182–191.
2. Blomqvist, P., McNamee, M. S., Andersson, P., Lönnermark, A. (2012), *Polycyclic Aromatic Hydrocarbons (PAHs) Quantified in Large-Scale Fire Experiments*, Fire Technology, 48, 513–528.
3. BMU / Bundesministerium für Umvelt, Naturschutz und nukleare Sicherheit (2021), *Dioxins and PCBs*, available at: https://www.bmu.de/themen/gesundheit-chemikalien/gesundheit/lebensmittelsicherheit/verbraucherschutz/uebersicht-ueber-dioxine-und-pcbs/dioxine-und-pcb#c18183.
4. Buzzo, G., Gigante, G., Nebula, F., Palumbo, R., Pascarella, D., Vozella, A. (2021), *Risk Assessment for Illegal Waste Open Burning*, E3S Web of Conferences 241, 03005, ICEPP 2020, available at: https://doi.org/10.1051/e3sconf/202124103005.
5. Costner P. (2006), *Update of Dioxin Emission Factors for Forest Fires, Grassland and Moor Fires, Open Burning of Agricultural Residues, Open Burning of Domestic Waste, Landfills and Dump Fires*, International POPs Elimination Network, available at: https://ipen.org/sites/default/files/documents/ipen_dioxin_open_fires-en.pdf.
6. EC / European Commission (2009), *Reduction of Dioxin Emissions from Domestic Sources*, available at: https://ec.europa.eu/environment/archives/dioxin/pdf/brochure09.pdf.
7. EPA / United States Environmental Protection Agency (2003), *Dioxins Produced by Backyard Burning*, available at: https://www.epa.gov/dioxin/dioxins-produced-backyard-burning.
8. Ferronato, N., Torretta, V., (2019), *Waste Mismanagement in Developing Countries: A Review of Global Issues*, Int. J. Environ. Res. Public Health 2019, 16, 1060.

9. Government of Canada (2015), *Open burning of garbage: health and environmental risks*, available at: https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/municipal-solid/environment/open-burning-garbage-health-risks.html.
10. Hoffer, A., Jancsek-Turóczi, B., Tóth, A., Kiss, G., Naghiu, A., Levei, E. A., Marmureanu, L., Machon, A., Gelencsér, A. (2020), *Emission factors for PM10 and polycyclic aromatic hydrocarbons (PAHs) from illegal burning of different types of municipal waste in households*, Atmos. Chem. Phys., 20, 16135–16144.
11. Ignat, V. (2013), *Fierul vechi a pus pe hartă Sinteștiul. Dolce farniente-ul rromilor cu proprietăți de milioane de euro de lângă București*, Adevărul, 30 Ianuarie 2013, available at: https://adevarul.ro/news/bucuresti/fierul-vechi-pus-harta-sintestiul-dolce-farninete-ul-rromilor-propietati-milioane-euro-bucurestiu-1_51091e5d4b62ed5875b9d595/index.html.
12. Ilie, L. (2021), *Crime networks suspected of burning tech waste for scrap metal in Romania*, Reuters, April 16, 2021, available at: https://www.reuters.com/business/environment/crime-networks-suspected-burning-tech-waste-scrap-metal-romania-2021-04-16/.
13. IPEN / International Pollutants Elimination Network (2021), *Plastic waste disposal leads to contamination of the food chain*, available at: https://ipen.org/sites/default/files/documents/ipen-plastic-waste-contamination-full-en.pdf.
14. McNamee, M. S., McNamee, R., Runefors, M., Sandvik, M., Amon, F. (2019), *Vehicle fire emissions with and without fire service intervention*, available at: https://www.researchgate.net/publication/337167769.
15. Mihai, F. C., Banica, A., Grozavu, A. (2019), *Backyard burning of household waste in rural areas. Environmental impact with focus on air pollution*, 19th International Multidisciplinary Scientific GeoConference on Ecology, Economics, Education and Legislation SGEM 2019, Conference Proceedings, vol.19, Issue 5.1, pp. 55-62.
16. Mikalsen, R. F., Lönnermark, A., Glansberg, K., McNamee, M., Storesund, K. (2021), *Fires in waste facilities: Challenges and solutions from a Scandinavian perspective*, Fire Safety Journal 120 (2021) 103023.
17. Muñoz, G. R., Panero, M. A. (2006), *Pollution prevention and management strategies for dioxins in the New York/New Jersey Harbor*, New York Academy of Sciences, available at: https://www.nyas.org/media/2922/06_dioxin_final.pdf.
18. Oprea, G. (2021), *Incendiu la un depozit de colectare a deșeurilor din Capitală*, Mediafax, 05.06.2021, available at: https://www.mediafax.ro/social/incendiu-la-un-depozit-de-colectare-a-deseurilor-din-bucuresti-20121053.
19. Raudonytė-Svirbutavičienė, E., Stakėnienė, R., Jokšas, K., Valiulis, D., Byčenkienė, S., Žarkov, A. (2022), *Distribution of polycyclic aromatic hydrocarbons and heavy metals in soil following a large tire fire incident: A case study*, Chemosphere 286 (2022) 131556.

20. Tuomisto, J. (2019), *Dioxins and dioxin-like compounds: toxicity in humans and animals, sources, and behaviour in the environment*, WikiJournal of Medicine, 6(1):8, doi: 10.15347/wjm/2019.008.
21. WDHS / Wisconsin Department of Health Services (2015), *Trash and Wood Burning*, available at: https://www.dhs.wisconsin.gov/air/burning.htm.
22. *** (2017), *Planul Național de Gestionare a Deșeurilor (PNGD)*, available at: http://www.mmediu.ro/categorie/documente-de-planificare-pngd-pjgd/239.

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THE ELDERLY DEPENDENCY RATE IN URBAN AREAS OF TRANSYLVANIA REGION BETWEEN 1992 AND 2021

RAISA ȚĂRUȘ[1], ȘTEFAN DEZSI[2]

ABSTRACT. – The Elderly Dependency Rate in Urban Areas of Transylvania Region between 1992 and 2021. Population ageing becomes a serious issue not only in developed countries, but also in a post-socialist country such as Romania. Nowadays, the demographic tendencies of ageing trends are visible in the demographic dynamics of developed countries, especially in Central and Eastern European Countries in the context of economic growth and population loss. For example, in Romania, it is noticeable in urban areas and rural areas where the demographic trajectories show the presence of a certain demographic phenomenon in age structure of population such as "population ageing". In the last decades, Romania has entered a period of rapid and dramatic ageing demographic phase. In this respect, first we investigate the phenomenon of population ageing in Transylvania region. Secondly, the paper presents the calculation of elderly dependency rate based on demographic statistical data provided by the National Institute of Statistics. Thirdly, it drives some possible social-economic effects of the progressive process of ageing tendency.

Keywords*: Ageing population, elderly people, population decline, Romania, Transylvania region.*

INTRODUCTION

Nowadays, demographic ageing is a topic of high importance in Europe and worldwide, in the context of concerns related to the impact of the rise in the ratio of the elderly in the society's functional organization (Stoica, 2011). The population ageing signifies "the process of change in the population's age group structure, in the sense of an increase in the older adult group's ratio to the detriment of the young group, as a visible and long-term trend" (Stoica, 2011).

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Population ageing is considered to be by United Nations (2002) a "process by which older individuals become a proportionally larger share of the total population". This process is a consequence of two main factors: low fertility rate and longer life expectancy (Diaconu, 2002), also the international migration, the improvement in health in general, and in particular, at higher ages allow an impetus to the ageing process (Asandului, 2012).

Population ageing is determined by the presence of several factors: prolonging the duration of life, a decrease of the proportion of the young population because of a fertility rate that is below the level of replacement and out-migration for this category of the population. It is a social-demographic issue that affects an increasing number of people, and its consequences affect the entire society (Nemenyi, 2011). Demographic ageing is a global phenomenon being a most important issue not only in developed countries like the USA, Japan, China, but also in East and Central European Countries. In the European countries, the percentage of the population over 65 increased from 15.60% in 2000 to 17.38% in 2010. European countries population aged over 65 years old (%) will increase to 20.06% in 2020 and to 23.55% in 2030, according to Eurostat predictions (Asandului, 2012).

Driven by fertility decline and the continuing extension of the life expectancy, the process of population ageing has not been uniform across time and space. The dynamics and timing of the ageing trend varies, depending on the country and the geographical area (Reynaud, et al., 2018). The absolute values as well as the relative size of the elderly population continues to grow in the EU countries where the ageing index raised to 132.3% reaching high values in countries such as: Italy 171%; Germany 158.5%; Portugal 157.4%; Greece 152.5%, Bulgaria 148.1%, Hungary 131.6%, and 117.3% in Romania (Țăruș, et al., 2021).

According to W. Lutz, W. Sanderson and S. Scherbov, the demographic statistics indicate a continuous ageing of the world's population throughout the century. The median age of the world's population would increase from 26.6 years in 2000 to 37.3 years in 2050 and then to 45.6 years in 2100 (Lutz, et al., 2008). According to Eurostat, the share of people aged 80 years or above in the EU's population is projected to have a two-and-a-half-fold increase between 2021 and 2100, from 6.0 % to 14.6 % (Eurostat, 2021). In the last decades, Romania not only experienced a difficult economic transition, but also experienced a decline in dynamics, facing a declining birth rate and fertility rate, out-migration phenomenon and ageing trends in rural and urban areas (Popa & Turek Rahoveanu, 2019). For example, in Romania, the proportion of population aged over 65 increased from 12.50% in 2000 to 14.94% in 2010. In 2020 the

elderly population will be 17.43 % and in 2030 it will be 20.25%. These increasing values indicate that Romanian population is visibly ageing (Asandului, 2012).

Hence, Romania is facing demographic prospects that are like other European Union (EU) countries (Hoff, 2011). Since 1990, the age structure of the Romanian population has shown a slow and continuous process of population ageing due to lower fertility, external migration, and an increase of life expectancy (Bodogai & Cutler, 2014). According to statistical data submitted by Eurostat, Romania will have one of the oldest populations in the EU in 2060. Also, the dependency ratio of the elderly, i.e., the ratio of those aged 65 and above to the active population, aged 15-64, will grow alarmingly, exceeding 60% by 2060 (Popa & Turek Rahoveanu, 2019).

All demographic projections for Romania point to a rapid expansion of the elderly population in the coming decades. Specific projections vary. For example, the demographer Gheţău (2007) has suggested that the population aged 60 years and older will increase from 19.3% in 2005 to 33.3% in 2050. Eurostat projections indicate an increase in the 65+ population from 14.9% in 2008 to 30.9% in 2050 and to 35.0% in 2060 (Giannakouris, 2008).

Regardless of the specificities, all projections converge on a common conclusion: rapid population ageing will occur in Romania in the coming decades (Bodogai & Cutler, 2014). The Transylvania region is currently facing the complex social and economic consequences of a population ageing process and deterioration of all demographic structures. The accelerated ageing process refers to the numerical increase of the segment of the elderly population aged 60–65 years and above out of the total population, because of the decrease in the fertility and mortality rate conceded by the increase in life expectancy. The ageing trends reached high values after 1992, marking a demographic transition from the traditional reproduction model with a high birth and mortality rates to the post-communist model represented by low birth rates and moderate mortality rates (Ţăruş, et al., 2021). It has been shown that the age structure changing process characterized by the increase of the elderly segment against the young segment can lead to a non-sustainable trend on the long term (Gheţău, 2012). This case study highlights the fact that demographic ageing has become a topic of social, economic, healthcare and even cultural debates because of the scale of its effects and impact. It is shown that specific combinations of declining fertility and mortality trends have resulted in an accelerating speed of ageing trends in most societies, including developing countries (Lutz, et al., 2008), as well as in Transylvania region.

Studying the demographic ageing process in Romania, especially the elderly dependency rate, we can settle new challenges regarding economic and social development. The case study approaches the ageing process being more visible on a local scale where urban areas are facing a range of demographic changes with different intensities.

The aim of the present study is to show the evolution of the elderly dependency rate in the reference interval 1992-2021 in Transylvania region to establish the social and economic impact of demographic ageing phenomenon.

DEMOGRAPHIC TRAJECTORIES OF POPULATION IN TRANSYLVANIA REGION

In the period between 1992 and 2021, demographic trajectories of the population in Transylvania region show a dramatic population decline emphasized by certain demographic tendencies such as low birth and fertility rate, out-migration, and population ageing. In 1992, the total population in Transylvania region on 1 January was 4,594,635 inhabitants, and until 2021 the population decreased by 215,689 inhabitants (-4.69%) reaching the value of 4,378,946, while 20.1 million people were recorded in the entire country in 2021, compared to 22.8 million in 1992, representing a decrease by 13% (Fig. 1).

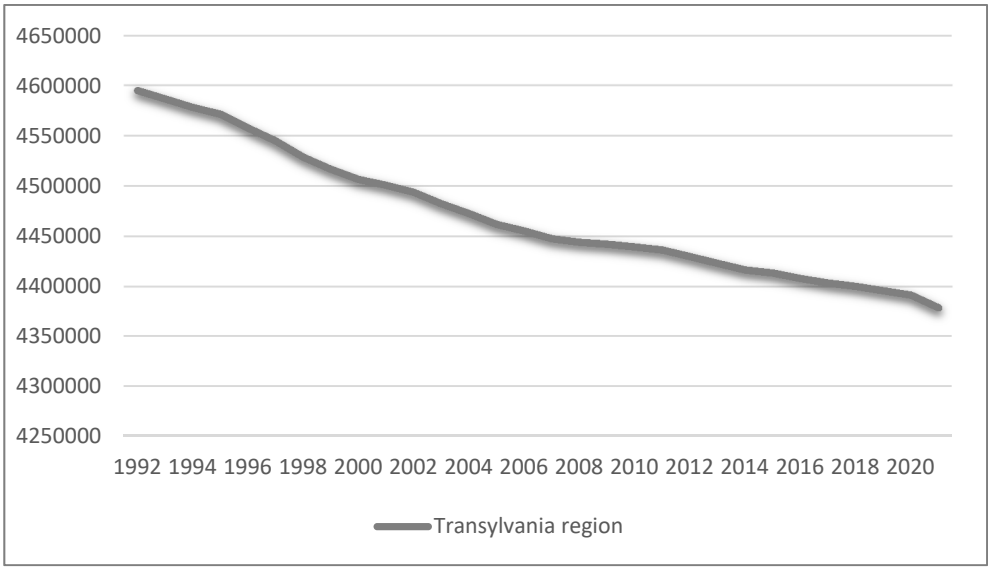

Fig. 1. Total population in urban area of Transylvania region

In the time frame between 1992 and 2021, the demographic tendencies in Transylvania show a steady increase in the number of elderly people. The demographic decline is characterized by a major change of the age structure of total population: the age group 0-14 years decreased by 314083 people; the age group 15-64 years decreased by 143291 people, while on the contrary the age group 65-85+ increased by 333274 people (Fig. 2).

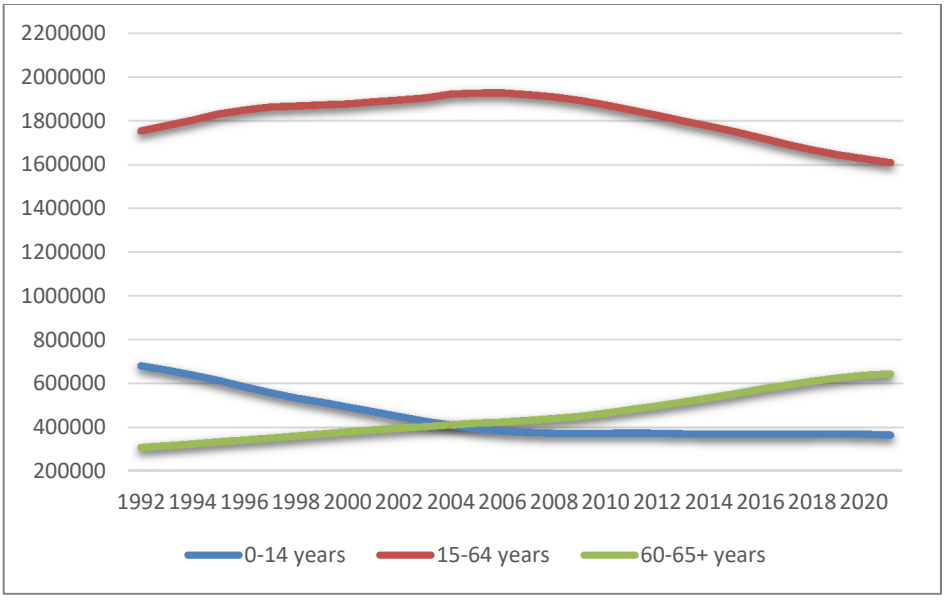

Fig. 2. Total population development by age groups in Transylvania

The INS (National Institute of Statistics) demographic projections distinguish two trajectories of population development in Transylvania: the first one between 2010 and 2015 with a moderate loss of population, the second one between 2015 and 2050 when the total population is forecasted to decline sharply (INS, 2017).

Population ageing is a long-term trend which began several decades ago in Europe, part of a social, political and cultural issue in Transylvania region. This trend is visible in the numbers recorded by age structure of the population with an increasing share of elderly people coupled with a declining share of working-age people in the total population (Eurostat, 2021).

MATERIALS AND METHODS

Many indicators have been used to study population ageing. Unfortunately, these indicators often depend on the specification of an arbitrary age threshold that defines the elderly population. For example, in developed countries – such as Romania – age 65 defines the lower margin of the elderly population as this age is usually associated with the age of retirement for the men, which starts at age 62 for the women. In this case study, we use the elderly dependency rate, and it seems to be one of the more accurate measurements to analyze the ageing process in relation to the adult active population.

The elderly dependency rate is a conventional value of elderly dependency, which defines that the elderly population (60+) depends on adult population (15-59), and generally the result is multiplied by 100. The final result gives the number of elders per 100 adults (Mishra, 2011).

$$\text{The elderly dependency rate (\%)} = (\text{Elderly people (60 years and above)})/(\text{Adult-active people (15-59 years)}) \times 100\% \quad (1)$$

For Transylvania region, we computed the elderly dependency rate on January 1 across the urban areas of ten counties during an observation period of 31 years (1992-2021).

The data show the evolution of the elderly dependency rate in urban areas of Transylvania region choosing the 1992-2021 timeline period, while statistical data were collected from Tempo Online database of the National Institute of Statistics (INS).

In general, the ageing phenomenon is the result of the interplay of two forces of population dynamics – fertility and mortality. There are two processes involved in the ageing of a population – ageing due to change at the base, consequent to the decline in fertility, and ageing due to change at the apex, responsible to the mortality reduction in the elderly population (Mishra, 2011). In this respect, our case study analysis allows us to consider the two principal determinants of ageing: fertility reduction and life expectancy increase.

RESULTS AND DISCUSSIONS

The ageing process has had a progressive course in Transylvania region, which began in the latter half of the 20th century, particularly in the countryside, where rural areas were facing major demographic changes and appeared to be

at greater demographic risk (Epure & Guran-Nica, 2014). These demographic changes occurred in the age structure of the population are also affecting the urban areas in Transylvania region.

The calculation of the elderly dependency rate in urban areas show that Transylvania region has experienced an accelerating process of ageing from 17.63% in 1992 to 39.90% in 2021.

This increasing elderly dependency rate refers to the existence of cumulative causes as low birth and fertility rate, out-migration, and an increasing life expectancy. Therefore, an important impact had the shift occurred in age structure of urban population, hence changing the total population evolution. The alternative up and down flows of total urban population evolution are changed into an upward shift characterized by an increasing number of elderly people to the detriment of a fewer number of adult active people.

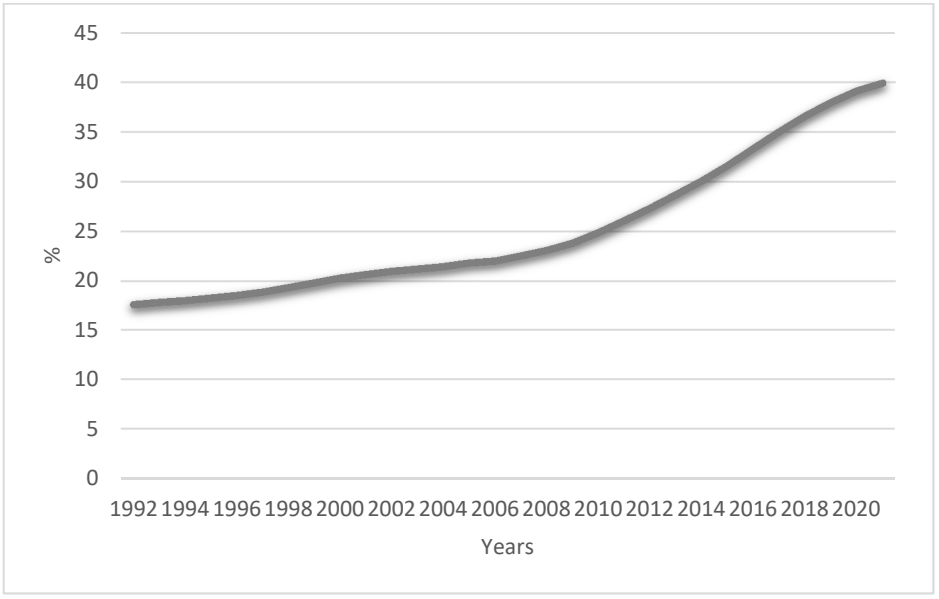

Fig. 3. The elderly dependency rate in urban areas of Transylvania region

In the interval 1992–2021, the share of elderly people in the urban areas increased up to the middle of the period, then decreased by the end of 2021. It prominently reverses its tendency of decreasing trend due to the demographic shifting of age groups.

A significant increase of the elderly dependency rate from 11.36% in 1992 up to 28.26% in 2021 is evident in urban areas of Sălaj County, followed by Bistrița-Năsăud County where the elderly dependency rate increased from 12.80% in 1992 up to 32.47% in 2021. This slight increase is the direct consequence of a low fertility rate, and it was also due to less job opportunities and a progressive out-migration of the active population. In these two counties, the elderly population has an incipient increase which means that the changes in demographic dynamics are more evident in the middle of the interval after 20 years, as the values registered in the 2010s were 15.77% in Sălaj County and 18.99% in Bistrița-Năsăud County (see Fig. 4).

As expected, the dependency factor in these urban areas is much lower than in the rural areas, since towns provide more job opportunities for young and active adult people, and increasing values strictly determine a light process of demographic ageing.

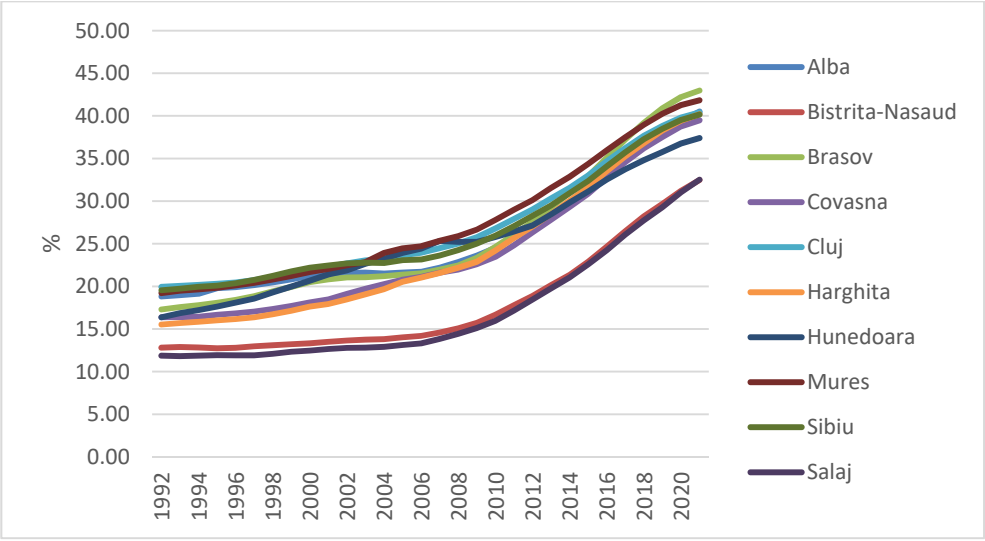

Fig. 4. The elderly dependency rate in urban areas at the county level

An important increase of the elderly dependency rate ranging from 15% and up to 43% in the interval 1992–2021 has a visible trend in urban areas of Harghita, Covasna, Hunedoara, Cluj, Alba, and Sibiu counties. In the urban areas of Alba County, the elderly dependency rate increased from 18.80% in 1992 up to 40.58% in 2021 (see Fig. 4). Also, an important growth of the elderly dependency rate from 19.94% in 1992 and up to 40.39% in 2021 has been

recorded in the urban areas of Cluj County. This intermediate area of increase (15–43%) of the elderly dependency rate is considered a constant growth due to the increasing trend of the elderly people which raises the impact of the social-economic pressure on adult active people. In this regard, social-demographic circumstances are questionable, as one of the most numerous age groups (55-59) will soon reach retiring age, which will dramatically increase the numbers of the dependent population, resulting in higher pressure on the active population (Epure & Guran-Nica, 2014).

In the 1992–2021 interval, a major increase of the elderly dependency rate is evident in the urban areas of Mureș and Brașov counties, where it ranges from 20% in 1992 and up to 43% in 2021 (see Fig. 4). This means that the young and adult active age groups are struggling to catch up with the social-economic benefits in the context of the ageing tendency, resulting in an increase of the elderly population. The elderly dependency rate registered an increase trend from 17.30% in 1992 up to 42.98% in Brașov County and from 19.21% in 1992 up to 41.84% in 2021 in Mureș County, raising the possibility to extend the retirement age and the opportunity to actively involve the elderly people in the labor market. Meanwhile, the number of young people is decreasing, and the future generations of active adult people will have to support a higher number of non-actives.

The ageing phenomenon has become a major issue in the urban areas of Transylvania region, where around the year 2020 the urban population would record approximately 50% (Barthelemy, et al., 2009) of the elderly population having a major influence on population age structure shifting.

THE SOCIAL-ECONOMIC EFFECTS OF POPULATION AGEING

Europe is currently facing the highest ageing rate worldwide. For example, Romania, as an EU-member country since 2007, has been coping with its own demographic difficulties, for example an overall population decline, an increased proportion of elderly and a longer average life-span, a majority of elderly females (Epure & Guran-Nica, 2014). In 2012, individuals aged 60 and above represented 22% of Romania's population, with 25.5% living in rural areas and 19% in urban areas.

The ageing phenomenon has an increasing trend at national level and regional level, where the total urban population needs to face significant social-economic implications. The social-economic implications are reflected in the impact of the ageing process of population. The ageing process is the degree of

demographic dependency. When it comes to the ratio between the inactive population groups (both young and elderly) and the active population (15 to 59 age group), this indicator provides valuable information regarding the economic burden placed on the active productive population. This is based on the concept of "dependent" being understood as active, while the "able" population can also be viewed as maintained (namely economically dependent) (Epure & Guran-Nica, 2014).

In this case study, we highlight some social-economic effects regarding population ageing, such as:

- The higher number of elderly people, mostly retired and inactive, generates a greater pressure on the active adult people, and the social and economic issues become even more acute as the existing pension system cannot adequately sustain the increasing number of older populations.
- At a higher age, physical and cognitive performance decreases. Initially, this can still be compensated by experience, but a decline in labor productivity can be expected with increasing age. However, policy makers sustain the undeveloped potential of elderly people and encourage them to participate actively in the economic and social life.
- The increasing number of elderly people will put pressure on public sector benefits such as adult care, health care or pensions which will increase considerably because of an accelerating process of ageing. Moreover, the higher number of elderly people will create pressure on social and economic policies.
- Also, the health system needs to adjust and improve the health care services to meet the increasing demands of the elderly people.
- An ageing society is characterized by declining labor productivity and rising price levels; the international competitiveness of the economy is declining. As a result, this society will export fewer goods and services and tend to import more instead. This will result in a decline in the current account balance (Petersen & López, 2019).
- A high proportion of older people leads to a decline in the overall savings rate. Likewise, this means that the share of consumer demand in GDP is increasing. As a result, fewer goods and services are left for export. Thus, the difference between exports and imports is shrinking. If the country already has a current account deficit, it will become larger (Petersen & López, 2019).
- If a certain age group consumes more goods and services than it produces itself, this has a price-increasing effect. This is the case with children, young people, and pensioners, so that an inflation-increasing effect can be expected from these groups (Petersen & López, 2019).

One of the biggest challenges of demographic change is that the consequences of ageing population will show up simultaneously in the public service systems, e.g., in the pension scheme, the healthcare and care systems. Thereby, the consequences in one system will be exacerbated by those in other spheres. To ensure social and economic participation across generations, the public service systems should be made resilient to demographic change, which means that they should be adaptable to the requirements of the ageing trends and stabilized through coordinated and innovative measures (Esche, et al., 2019).

CONCLUSIONS

During the past thirty years, the tendency of the degree of elderly dependency rate to go up is undoubtedly determined by a rapid process of population ageing. This case study concerning Transylvania region shows that urban areas are facing demographic changes due to a decrease in the birth rate, an increase in the mortality rate, and a negative migration balance with increase in the life expectancy.

The higher ageing intensity for the urban areas of Transylvania region can be related to the dramatic decrease in the fertility rate and the birth rate; moreover, one needs to take into account the out-migration of young and skilled people for work purposes in developed countries. In these social-economic circumstances, the population ageing becomes a global phenomenon with long-term consequences on the economy. The Transylvania region is facing major demographic changes in the context of demographic decline, as the ageing process has a higher impact on the changes within the age structure of the population. The number of elderly people increases to the detriment of the number of active adult people, which steadily decreases. Additionally, the young people and the active adults have manifested shrinking tendencies due to the dynamic population ageing process.

As the elderly dependency rate increases, there is a decline in the size of the workforce that is potentially available to take care of the older generations and this has already led to an increased burden on government finances, changes to the statutory retirement age, and in some cases even lower levels of pension provision (Eurostat, 2020).

The Romanian policy makers should take the necessary steps now and start adjusting to these issues to avoid the risk of endemic poverty among elderly people. From this point of view, a coherent medium-and-long-term development

program should be drawn up, capable to rebalance the demographic structure and solve many of the problems associated to rapid ageing phenomenon (Epure & Guran-Nica, 2014).

REFERENCES

1. Asandului, L., (2012), *Population ageing in Romania: Facts and Analysis,* The 6th International Days of Statistics and Economics, Prague, Czech Republic.
2. Barthelemy, P., Granier, R., Martine, R. (2009), *Demography and Society*, Institutul European, Iași.
3. Bodogai, I., S., Cutler, J., S. (2014), *Aging in Romania: Research and Public Policy*, The Gerontologist, 54, (2), 147-152
4. Diaconu, Maxim, L. (2002), *Ageing population: comparative analysis among European Union States*, Ces Working Paper, VII, (1), 50-59
5. Epure, M., Guran-Nica, L. (2014), *Socio-Economic Characteristics of the Elderly Population in Romania*, International Conference on Economic Sciences and Business Administration, Spiru Haret University, Vol. 1, (1), 128-135.
6. *** Esche, A., Lopez, L., Hamburg, A., Pavenstadt, M. (2019), *Demographic resilience*, accessed at https://www.bertelsmann-stiftung.de/en/our-projects/demographic-resilience-and-participation/project-description on 8th December, 2021.
7. *** Eurostat, 2021. *Population structure and ageing*, accessed at https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Population_structure_and_ageing, on 8th December, 2021.
8. Giannakouris, K. (2008), *Ageing characterises the demographic perspectives of the European societies*, Eurostat – Statistics in Focus, no. 72, 1-12.
9. Gheţău, V. (2012), *Drama noastră demografică*, Campina, București.
10. Hoff, A. (2011), *Population ageing in Central and Eastern Europe: Societal and policy implications,* Ashgate Publishing, Surrey, England.
11. Lutz, W., Sanderson, W., Scherbov, S. (2008), *The coming acceleration of global population ageing*, Nature, Volume 451,716-719.
12. Mishra, S., V. (2011), *The Elderly Dependents in India: A Critical Review*, The Indian Journal of Spatial Science, II, (2), 1-14.
13. Nemenyi, A. (2011), *Demographic Ageing in Romania-General and Specific Consequences on the Rural Population and the Relation to International Migration*, In Book Population Ageing in Central and Eastern Europe, 1st Edition, Routledge, England, 151-154.
14. Petersen, T., Lopez, L. (2019), *Demographics and Foreign Trade: What Are the Effects of an Aging Population on the Current Account Balance of an Economy?*, accessed at https://globaleurope.eu/globalization/effects-of-aging-population/ on 8th December, 2021.

15. Popa, A., M., Turek, Rahoveanu, A. (2019), *Population Migration, Cause of The Decline of the Romanian Village*, 33rd IBIMA Conference, 10-11 April, Granada, Spain.
16. Reynaud, C., Miccoli, S., Lagona, F. (2018), *Population Ageing in Italy: An Empirical Analysis of Change in the Ageing Index Across Space and Time*, Spatial Demography, 6, (28), 235-251
17. Stoica, I.-V. (2011), *The Effects of population ageing on rural areas. Case study: The Sărățele Hydrographic Basin (Buzău Subcarpa-thians)*, Analele Universității din Oradea-Seria Geografie, Volume 21, 294-302.
18. Țăruș, R., Dezsi, Ș., Pop, F. (2021). Ageing Urban Population Prognostic between 2020 and 2050 in Transylvania Region (Romania). Sustainability, 13, 9940.

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UNELE ASPECTE REFERITOARE LA GEOGRAFIA UNIVERSITARĂ CLUJEANĂ DIN PERIOADA 1940-1947

SORIN GEACU[1]

ABSTRACT. **Some Aspects Related to Geography in the Cluj University between 1940 and 1947.** The study includes a series of information that came out from the research of the archives belonging to the Romanian National Archives in Bucharest, regarding the troublesome period when the Cluj School of Geography and its Institute took refuge in Sibiu and Timişoara, and then came back to Cluj. The paper approaches several aspects concerning the organization and framing of the School of Geography departments, promotions that took place during that time, but also purges made on political criteria, as well as the involvement of staff members of the Institute of Geography within the Cluj University in the national action to support the territorial integrity of Transylvania, by means of their scientific research and studies.

Keywords: *"King Ferdinand I" University, refuge, Centre of Transylvanian Studies, Scientific sessions of Geography professors, Romanian Geographical Review, Transylvania, studies, territorial integrity.*

1. INTRODUCERE

Materializarea politicii revizioniste a unor state europene precum Germania nazistă, Ungaria, URSS şi Bulgaria, a avut consecinţe dramatice asupra României, înfloritorul regat fiind astfel supus unor rapturi teritoriale pe care a fost nevoit să le accepte pe moment, dată fiind conjunctura geopolitică internaţională nefavorabilă ei. Prăbuşirea rând pe rând ai aliaţilor tradiţionali ai României: Cehoslovacia, Polonia, Franţa şi mai apoi a regatelor Iugoslaviei şi Greciei, precum şi izolarea Regatului Unit al Marii Britanii şi Irlandei de Nord, au făcut imposibile aplicarea garanţiilor de securitate pentru România. În această conjunctură belicoasă, ţara noastră s-a văzut rând pe rând supusă cedărilor teritoriale în vara şi toamna anului 1940: la 28 iunie a Basarabiei şi Bucovinei de Nord ocupate

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samavolnic de URSS; la 30 august a Transilvaniei de nord-vest, cedată Ungariei hortiste în urma Dictatului de la Viena; la 7 septembrie a Cadrilaterului, respectiv județele Caliacra și Durostor, cedate Bulgariei nerecunoscătoare!

În această conjunctură nefavorabilă, Clujul s-a aflat inclus în teritoriul Transilvaniei de nord-vest cedat, astfel că, Universitatea „Regele Ferdinand I" a fost nevoită, aidoma altor multe instituții românești, să se refugieze din teritoriul cedat, în alte locații, respectiv la Sibiu și la Timișoara, unde a funcționat în perioada 1940-1945. La Sibiu au funcționat facultățile de Drept, Litere și Filosofie și Medicină cu institutele lor, iar la Timișoara, Facultatea de Științe, cu secțiile și institutele sale, printre care s-a numărat și Secția de Geografie și Institutul de Geografie al Universității. Trebuie menționat aici că în primul an al refugiului, în anul universitar 1940/1941, Secția de Geografie a funcționat separat, astfel: la Timișoara, catedra de Geografie fizică și a României și Institutul de Geografie sub conducerea profesorului Vasile Meruțiu, în cadrul Facultății de Științe; la Sibiu, catedra de Antropogeografie, sub conducerea profesorului Sabin Opreanu, în cadrul Facultății de Litere. Această despărțire vremelnică a pus serioase probleme de comunicare, de gestionare a secției, inducând unele tensiuni între șefii de catedră. Universitatea, cu facultățile și institutele ei, a avut un răgaz de doar două săptămâni pentru refugierea și delocalizarea în cele două locații.

2. ASPECTE MAI PUȚIN CUNOSCUTE

Anul 1940 a fost unul foarte dificil, întrucât în urma impunerii Dictatului de la Viena din 30.VIII.1940, Clujul a fost ocupat de Ungaria, astfel, Universitatea „Regele Fedinand I" a fost nevoită să ia calea refugiului. După instalarea la Timișoara a Facultății de Științe a Universității din Cluj, Secția de Geografie avea următoarea încadrare: profesorii Vasile Meruțiu și Sabin Opreanu, șefii de lucrări – Tiberiu Morariu și Laurian Someșan, asistenți – Radu Meruțiu și Alexandrina Hațiegan și preparatori Elena Hotăran și Fabiu (Fabian) Dumbravă. Cele două catedre: una de Geografie Generală și Geografie Umană și cealaltă de Geografie fizică și Geografia României, constituiau de fapt Institutul (Secția) de Geografie a Universității.

Din documentele păstrate, în 1941 se întrezărea *o ruptură* a secției clujene de Geografie. Cauza era faptul că Facultatea de Litere a Universității fusese evacuată împreună cu sediul Universității la Sibiu, unde, cei care urmau specializarea Istorie-Geografie nu aveau cadre didactice pentru disciplinele geografice. Inițial, pentru foarte scurt timp, a predat profesorul Sabin Opreanu. Dar apoi, consiliul Institutului a optat pentru Laurian Someșan, care, detașându-se la Sibiu, a predat cursurile de Geografie umană. Someșan era și cadru didactic pentru disciplinele geografice la Academia Comercială „Regele Mihai I" din Cluj refugiată la Brașov. Așa s-a reușit să rămână integral Institutul de Geografie la Timișoara.

În luna iulie a anului 1941, se constituie „Centrul de Studii Transilvănene" al Universităţii „Regele Ferdinand I" din Cluj-Sibiu, care, atunci, cuprindea şi o „Secţie Etnografică şi Geografică", în care au activat şi Sabin Opreanu şi Laurian Someşan. În cadrul Societăţii de Ştiinţe din Cluj, se organizase în 1941-1942 „Colocviul Geografic" în care, în cele 3 şedinţe organizate se susţinuseră 6 comunicări.

Tot profesorul Opreanu a participat şi la Congresul profesorilor de Geografie din România desfăşurat la Arad (25-28.X.1943), în care a conferenţiat despre „*Valea Mureşului ca axă a Românismului*", iar profesorul Alexandru Borza despre „*Importanţa antropogeografică şi fitogeografică a valurilor şi movilelor din Banat*".

Profesorul Sabin Opreanu fusese şi delegatul geografilor ardeleni la Congresul Profesorilor de Geografie din România desfăşurat la Piatra Neamţ (19-21.V.1940).

Institutul de Geografie înfiinţase „Colocviile profesorilor de Geografie" în luna februarie 1942, preşedinte fiind profesorul Sabin Opreanu. În 1942 în cadrul acestora se prezentaseră 11 comunicări ştiinţifice. Colocviile profesorilor de Geografie de la Timişoara, au fost create din dorinţa de a se păstra o legătură cât mai strânsă între profesorii din mediul preuniversitar şi lumea geografică universitară, după modelul Universităţii din Bucureşti. Iniţiativa creerii acestora o avuseseră profesorii Sabin Opreanu şi Tiberiu Morariu, scopul lor fiind „*intensificarea cercetării problemelor geografice şi a celor înrudite cu geografia*". Lucrările s-au desfăşurat în sala de cursuri a Institutului de Geografie. Dintre comunicări amintim pe cele susţinute de: Tiberiu Morariu: „*Păreri germane şi maghiare asupra structurii entice a oraşelor Transilvaniei, Banatului şi Crişanei"; „Elementul germanic în Transilvania"*; Sabin Opreanu: „*Scoaterea aurului din nisipurile fluviatile din regiunea Borlova (Banat) şi de pe valea Mureşului"; „Călătoria lui Beniamino da Tudela în Vlachia în secolul al XII-lea"; „Terasele artificiale pentru culturi în România"*; Alexandrina Haţiegan: „*Evoluţia reţelei hidrografice a Sibiului"*.

Prin pensionarea în 1941 a profesorului Vasile Meruţiu, Catedra de Geografie fizică şi Geografia României s-a declarat vacantă prin Monitorul Oficial din 9.VI.1942. Consiliul Facultăţii de Ştiinţe desemnase o comisie însărcinată cu ocuparea acesteia, alcătuită din profesorii Alexandru Borza (preşedinte), Sabin Opreanu, Victor Stanciu şi de la Bucureşti profesorul Vintilă Mihăilescu, iar de la Iaşi, profesorul Mihai David. La 22.VI.1942 ea se întruneşte la Institutul Botanic, opinând pentru ocuparea ei de către şeful de lucrări Tiberiu Morariu „*care prin activitatea sa valoroasă, prin activitatea sa didactică şi organizatorică, prin personalitatea sa culturală şi prin activitatea sa naţională, întruneşte toate condiţiile pe care legea le cere de la un profesor universitar*" (ANCR, Fond MCNC, Dos. 1299/1942, f. 267).

În raportul acelei comisii era specificat şi faptul că: „*Domnul T[iberiu]. Morariu este şi un organizator iscusit. Dacă Institutul de Geografie a salvat cu prilejul refugiului o mare parte din frumoasa lui zestre de la Cluj, este meritul de necontestat*

al dânsului. De la început, până în ultimul moment al părăsirei Clujului, dânsul a privegheat neobosit ca să fie împachetat şi expediat tot ce era necesar la Institut şi în refugiu, şi să poată funcţiona din primul moment în bune condiţiuni. Astfel, a fost adusă la Timişoara aproape întreaga zestre câştigată de Institut de la Unire încoace ca; bibliotecă, hărţi, dispozitive şi aparate. La Timişoara în ultimii doi ani, de asemenea a contribuit plin de iniţiativă şi râvnă la organizarea şi completarea cu cele necesare a Institutului" (ANCR, Fond MCNC, Dos. 1299/1942, f. 272).

Prin Decretul 3738 din 22.XII.1942, Ştefan Manciulea se numeşte „*conferenţiar de Geografie regională (Geografia ţărilor)*" (ANCR, Fond MCNC, Dos. 2524/1943, f. 30). Gheorghe Pop este trecut ca şef de lucrări suplinitor în locul lui Tiberiu Morariu promovat profesor şi şef de catedră. Licenţiat în Ştiinţe Naturale, fusese preparator la Laboratorul de Mineralogie. Tiberiu Morariu, într-un referat înaintat decanului Facultăţii de Ştiinţe la 19.XI.1942, menţiona faptul că Gheorghe Pop „*este un element bine pregătit şi care lucrează într-un domeniu care este în strînsă legătură cu Geografia fizică, îl recomand cu toată convingerea, că în momentele actuale nu avem o altă persoană mai potrivită pentru suplinirea acestui post*" (ANCR, Fond MCNC, Dos. 4375/1945, f. 248).

Consiliul Societăţii Regale Române de Geografie în şedinţa din 24.IV.1942, a adoptat hotărârea de a elabora „*Dicţionarul Geografic al Transnistriei"*, ancheta de teren desfăşurându-se între 28.VII,1942 şi 15.IX.1942. La aceasta au luat parte dr. Tiberiu Morariu şi studentul Marius Bizerea. Consiliul realizase şi un chestionar cu 100 de puncte, la alcătuirea căruia participase şi profesorul Sabin Opreanu.

La 15.V.1942, în cadrul Societăţii Regale Române de Geografie, Valeriu Butură prezentase comunicarea „*Plante medicinale în credinţa românilor din Ţara Oltului*". În Consiliul Societăţii Regale Române de Geografie din 14.II.1940 fuseseră aleşi Vasile Meruţiu, Sabin Opreanu şi Ştefan Manciulea. Meruţiu era reprezentant şi în comitetul de redacţie al Buletinului acestei Societăţi (1940-1942).

Notăm şi colaborarea geografilor clujeni la Revista Geografică Română (director Nicolae Alexandru Rădulescu, cu apariţie la Cluj şi Bucureşti) şi anume: Tiberiu Morariu – „*Contribuţiuni la glaciaţiunea din Munţii Rodnei"* (1940) şi „*Distribuţia geografică a populaţiei Transilvaniei, Banatului, Crişanei şi Maramureşului în 1930"* (1941); Sabin Opreanu – „*Călătoria lui Beniamino da Tudela în Vlachia"* (1942) şi Laurian Someşan – „*Rolul factorilor geografici în aşezarea şi în viaţa economică a satelor din Depresiunea Sibiului"* (1942). În comitetul de redacţie al acesteia erau Tiberiu Morariu (Timişoara) şi Laurian Someşan (Sibiu), iar în 1943 Tiberiu Morariu şi Ştefan Manciulea (Timişoara).

Fabiu Dumbravă, în 1944, avea întocmite „*Harta localităţilor româneşti din judeţele Sătmar şi Sălaj*" la scara 1/500.000 şi „*Harta cu repartiţia românilor în Secuime*" la scara 1/1 milion (ANCR, Fond MCNC, Dos. 1583/1944).

În anul 1947 au fost îndepărtaţi din facultate profesorii Sabin Opreanu şi Ştefan Manciulea pe criterii politice. De exemplu, „*refuzând să intre în PCR, Ştefan Manciulea este eliminat din învăţământul superior cu formula comprimarea catedrei*" (Sorina Vlad et alii, 2000, *op. cit*., pag. 198).

3. IMPLICAREA GEOGRAFILOR CLUJENI ÎN ACŢIUNEA NAŢIONALĂ DE SUSŢINERE A INTEGRITĂŢII TERITORIALE A TRANSILVANIEI

Este un aspect foarte important, dar puţin semnalat. Dictatul nefast de la Viena din 30.VIII.1940, a impus României cedarea unei părţi a Transilvaniei şi a Crişanei, dar şi a întregului Maramureş către Ungaria. Urmarea a fost că, în anii următori, în vederea redobândirii teritoriului cedat, la iniţiativa dar şi cu sprijinul înaltelor autorităţi centrale din Bucureşti, s-au elaborat diferite studii referitoare la caracterul unitar al Transilvaniei, dar şi la rolul acesteia în cadrul Regatului Român. În cadrul acestei acţiuni, au fost implicaţi şi geografi universitari clujeni, care, animaţi de un profund patriotism, au purces la alcătuirea şi publicarea de contribuţii geografice documentare în această privinţă (de geografie istorică, umană, economică şi politică). Acestea s-au realizat îndeosebi în limbile română şi germană, numai câteva fiind redactate în limbile italiană, franceză şi engleză.

Cei cinci geografi au fost: Tiberiu Morariu, Sabin Opreanu, Laurian Someşan, Ştefan Manciulea şi Vasile Meruţiu. Profesorul Morariu chiar menţiona în unele rapoarte înaintate decanului Facultăţii de Ştiinţe din Timişoara sau rectoratului Universităţii din Cluj, la Sibiu, faptul că în vara anului 1940 „*am fost însărcinat să lucrez de către Ministerul Afacerilor Străine şi Ministerul Propagandei pentru lucrări geografice şi etno-demografice*" (ANCR, Fond MI, Dos. 1055/1940, f. 54) şi că, printre lucrările solicitate de Ministerul Propagandei, s-au numărat şi cele referitoare la Maramureş.

Dintre studiile publicate de Tiberiu Morariu amintim: „*Entwicklung der Bevölkerungsdichtigkeit Siebenbürgens während der Jahre 1840-1930*" (Bucureşti, 1940), „*Elementul germanic în Transilvania"* (Timişoara, 1942), „*Maghiarizarea oraşelor din Transilvania"* (Sibiu, 1943) şi „*Transilvania şi Maramureşul"* (Sibiu, 1944).

Referitor numai la Maramureş, de la Tiberiu Morariu ne-au rămas patru lucrări semnificative: „*Maramureş – politisch, ethnich und wirtschaptlich"* (Bucureşti, 1941), „*Maramureşul în oragnismul etnic şi politic al Ţării Româneşti"* (Bucureşti, 1941), „*Die Maramureş. Ein rumänisches Kerngebiet"* (Bucureşti, 1942) şi „*Emigrări maramureşene în Transilvania"* (Sibiu, 1944).

Profesorul Sabin Opreanu a elaborat lucrările: „*La Transilvania, nell`unità naturale della Romania"* (Bucureşti, 1940); „*Siebenbürgen, eine naturgegebene Engänzung des rumänischen Lebensraumes"* (Bucureşti, 1940); „*Valea Mureşului,*

axă etnică a Transilvaniei" (Sibiu, 1941); *„Valea Mureşului, axă economică a Transilvaniei"* (Sibiu, 1941) şi cea cu semnificativul titlu *„Transilvania, centrul pământului românesc"* (Sibiu, 1944).

Şi implicarea profesorului Laurian Someşan a fost impresionantă, acesta publicând studiile: *„Il problema etnico e geopolitico della frontiera occidentale"* (Bucureşti, 1940, în colecţia Studi e documenti romeni), *„Ţara Silvaniei în unitatea spaţiului transilvan"* (Zalău, 1940), *„Aşezarea şi hotarul spaţiului transilvan"* (Sibiu, 1940), *„Fizionomia satului transilvan"* (Sibiu, 1941), *„Alter und Entwicklung der rumänischen Landwirtschaft in Siebenbürgen"* (Bucureşti, 1941), *„Câmpia Tisei ca barieră etnică"* (Bucureşti, 1943). Lucrarea sa *„Pământul românesc*" a fost publicată în limba franceză (*„Le sol roumain"*, Sibiu, 1944) de Centrul de Studii şi Cercetări privitoare la Transilvania. Totodată, broşura cu tilul *„Vechimea şi evoluţia agriculturii româneşti în Transilvania",* tipărit la Braşov în 1941, s-a publicat şi în limba italiană (*„L'origine dell`agricoltura romena in Transilvania e la sue evoluzione")* la Bucureşti, în anul 1943.

Cu deosebită minuţiozitate a lucrat şi marele cărturar Ştefan Manciulea. Lui îi datorăm mai multe contribuţii cum sunt: *„Românii şi minorităţile etnice din Transilvania şi părţile ungurene în întâia jumătate a veacului al XIX-lea"* (Bucureşti, 1940), *„La frontière Ouest de la Roumanie"* (Bucureşti, 1940), *„Transilvania în cărţile româneşti de geografie apărute până la 1848"* (Timişoara, 1942), *„Elemente etnice străine aşezate în Banat între anii 1000 şi 1870"* (Timişoara, 1943). Studiul său intitulat *„Aşezările omeneşti din Ungaria şi Transilvania în secolele XIV-XV"* (1941), a fost premiat în manuscris de către Academia Română în sesiunea generală din anul 1940 cu Premiul Statului. Totodată, volumul *„Câmpia Transilvaniei*", pe care l-a publicat în colecţia cu frumosul titlu „Ţară şi Neam" (Bucureşti, 1944), a fost considerat a fi *„cea mai bună şi cea mai completă monografie asupra Câmpiei Transilvaniei*" (Revista Geografică, 1946, III, 1-3, pag. 207).

Şi profesorul Vasile Meruţiu scrisese lucrarea *Nordwest Rumänien*, publicată la Bucureşti în anul 1940, în publicaţiile Ministerului Afacerilor Străine, colecţia „Denkschrifte und Dokument".

La iniţiativa ministerelor Propagandei şi Afacerilor Străine din Bucureşti, s-a alcătuit şi un volum intitulat *„Transilvania*" şi publicat în 1943 în limba germană (*„Siebenbürgen*"). În cadrul acestuia sunt inserate şi contribuţiile marilor geografi clujeni, astfel: Tiberiu Morariu – *„Das Dentschtum in Siebenbürgen*"; Ştefan Manciulea – *„Die Städte Siebenbürgen*"; Sabin Opreanu – *„Die Szekler*" şi Laurian Someşan – *„Die Ungarn*".

După terminarea celui de-al Doilea Război Mondial, geografii clujeni s-au implicat în acţiunea de documentare necesară membrilor participanţi la Conferinţa de Pace de la Paris (1946-1947). Scopul a fost acelaşi – revenirea Transilvaniei de Nord în trupul României şi restabilirea graniţei româno-ungare de la 1.I.1940.

Principala contribuţie în acest sens este lucrarea elaborată de Tiberiu Morariu şi Sabin Opreanu şi publicată în limba engleză cu tilul „*The western frontier of Rumania*" (Cluj, 1946). Aceasta s-a tipărit şi pe autori. Astfel, profesorul Tiberiu Morariu chiar nota faptul că lucrarea „*Graniţa de vest a României din punct de vedere fizic şi biogeografic*" (Cluj, 1947) a fost „*făcută din încredinţarea Ministerului de Externe pentru Conferinţa Păcii*" (ANCR, Fond MCIP, Dos. 353/1947, f. 117). S-a publicat şi în limba engleză („*The western frontier of Rumania from the physical and biogeographical points of wiew*", (Cluj, 1946). Contribuţia profesorului Sabin Opreanu a avut titlul „*Frontiera de vest a României. Funcţiunea ei geoeconomică*" (Cluj, 1947).

Totodată şi studiul profesorului Ştefan Manciulea - „*Graniţa de vest*", tipărit în anul 1933, fusese „*apreciat de [ministrul] L[ucreţiu]. Pătrăşcanu, participant la Tratatul de Pace de la Paris din 1947*" (Terra, 1, 1985, pag. 58).

4. CRÂMPEIE DIN ACTIVITATEA DIN INTERVALUL 1. IV. 1946 – 1. IV. 1947 A MEMBRILOR SECŢIEI DE GEOGRAFIE

Profesorul Tiberiu Morariu avea sub tipar următoarele lucrări ştiinţifice: „*Vânturile locale din Transilvania, Banat şi Crişana*", „*Răspândirea geografică a vegetaţiei mediteranee din Banat*" şi „*Fântânile arteziene din Banat*".

Şeful de lucrări Gheorghe Pop efectuase cercetări de teren în toamna anului 1946 în regiunea de contact a bazinelor Mureş şi Bega (arealul Zam-Ilia-Făget), „*în vederea adunării de material ştiinţific documentar pentru elucidarea problemelor geomorfologice în legătură cu vechea hidrografie a Mureşului inferior, obiectul unui studiu cu caracter mai vast*" (ANCR, Fond MCIP, Dos. 353/1947, f. 118). Totodată efectuase şi multe excursii de cercetare a văii Chintăului (jud. Cluj) „*în scopul întocmirii unui studiu geomorfologic detaliat privitor la evoluţia acestei văi*" (ANCR, Fond MCIP, Dos. 353/1947, f. 118).

Asistentul Fabiu Dumbravă împreună cu Tiberiu Morariu întocmiseră „*Harta judeţului Cluj*" la scara 1/150.000, pe care au prezentat-o într-o şedinţă a secţiei Cluj a Institutului de Cercetări Geografice al României. Aceştia executau atunci şi „*Harta judeţului Năsăud*" care „*va fi curând terminată şi va fi tipărită în cuprinsul acestui an*" (ANCR, Fond MCIP, Dos. 353/1947, f. 119). Acesta menţiona totodată faptul că „*am adunat un bogat material cartografic din arhivele Inspectoratelor Cadastrale Timişoara şi Cluj referitor la judeţele din tot cuprinsul Transilvaniei, Banatului, Crişanei şi Maramureşului pe delimitatea suprafeţelor comunelor"* executată la iniţiativa profesorului Tiberiu Morariu, „*care ne va servi drept lucrare de doctorat pentru studiul Densitatea populaţiei din Transilvania pe intervalul de la 1860 la 1940*" (ANCR, Fond MCIP, Dos. 353/1947, f. 119).

Un aspect important relatat de Fabiu Dumbravă a fost următorul: „*din încredințarea Institutului de Geografie am condus ca și în anii precedenți serviciul administrativ al Institutului, organizând și ducând la bun sfârșit lucrarea migăloasă a întocmirii inventarului bunurilor Institutului cu ocazia reântoarcerii din refugiu la Cluj. În același timp, am dat un prețios ajutor la orânduirea bibliotecii Institutului care are aproape 10.000 de volume, aranjând apoi singur publicațiile periodice străine preluate de la fosta Universitate maghiară*" (ANCR, Fond MCIP, Dos. 353/1947, f. 120).

Asistenta Alexandrina Haţieganu întocmise şi predase pentru volumul VIII al Lucrărilor Institutului de Geografie clujean, studiul „*Olăritul pe valea Sebeşului*". Profesorul Sabin Opreanu avea două lucrări în curs de apariţie: „*Limita superioară a culturii porumbului în România*" şi „*Două epigeneze la nord și sud de Sălişte (jud. Sibiu)*".

Șeful de lucrări Valeriu Butură nota faptul că: „*Am urmărit îndeaproape aspectele variate ale vieții omenești în cuprinsul Munților Apuseni, pentru stabilirea marilor regiuni antropogeografice: Mocănimea, Țara Moților, Regiunea băieșilor mineritului, Țara Zarandului, Depresiunea Beiușului și Depresiunea Huedinului. Am redactat și lucrarea - Deplasări sezoniere pentru munci agricole la mocanii din valea Arieșului*" (ANCR, Fond MCIP, Dos. 353/1947, f. 123).

Preparatorul Marius Bizerea numit la 1.I.1947, şi funcţionând ca bibliotecar, alcătuise materialul intitulat „*Contribuţiuni la studiul Codrului bănăţean*".

În raportul Institutului de Geografie înaintat decanului Facultății de Ştiinţe la 16.VI.1947, semnat de profesorii Tiberiu Morariu şi Sabin Opreanu, se arăta faptul că acesta începuse tipărirea vol. VIII din *Lucrările Institutului de Geografie al Universității din Cluj* „*din care până la 1.IV.1947 s-au tipărit 6 coale. Din lipsă de fonduri tipărirea deocamdată nu o putem continua. Nădăjduim însă că în decursul acestui an s-o putem termina*" (ANCR, Fond MCIP, Dos. 353/1947, f. 127).

5. CONCLUZII

În timpul refugiului Secţiei de Geografie şi a Institutului omonim ale Universităţii Regele Ferdinand I la Sibiu şi la Timişoara în perioada 1940-1945, apoi în condiţiile dificile ale reîntoarcerii la Cluj din vara anului 1945, precum şi a reînnodării tradiţiei şcolii geografice clujene aşa cum a fost ea concepută şi pusă în practică de savantul George Vâlsan, şi a fost asumată ulterior de toţi membrii ei, aceştia au militat ca unul, prin toată fiinţa şi activitatea lor, pentru redobândirea integrităţii teritoriale şi de Neam a României. Membrii Institutului de Geografie şi-au pus tot elanul, cunoştinţele şi energia lor creatoare în slujba acestei datorii, prin cercetări şi studii doveditoare ale acestei unităţi.

Dacă la început studiile lor au fost răzleţe, începând cu 16 iunie 1942, odată cu crearea „Biroului Păcii" sub egida Ministerului Regal al Afacerilor Străine, la iniţiativa ministrului Mihai Antonescu, dar şi după disoluţia acestui birou odată cu ocuparea abuzivă a ţării noastre şi comunizarea ei de către URSS, cercetările şi studiile lor s-au desfăşurat într-un cadru organizat. Misiunea „Biroului Păcii" a fost aceea ca să întreprindă prin membrii săi cercetări amănunţite, materializate în studii care să dovedească justeţea revendicărilor româneşti, adică a graniţei sale de vest, a unităţii teritoriale a ţării, a vechimii şi continuităţii locuirii româneşti a spaţiului carpatic cuprins între Tisa, Nistru, Dunăre şi Marea Neagră, care să constituie dovezi la tratativele de pace de după cel de-al Doilea Război Mondial.

BIBLIOGRAFIE

1. Geacu, Sorin, 1997, *Profesorul Dr. Laurian Someşan (1981-1986)*, Revista de Etnografie şi Folclor, 42, *1-2*, Bucureşti.
2. Păcurar, Alexandru, 2019*, Lucrările Institutului de Geografie al Universităţii din Cluj – Travaux de l'Institut de Géographie de l'Université de Cluj (Roumanie) (1922-1947). Monografie*, Editura Argonaut, Cluj-Napoca.
3. Vlad, Sorina, Săgeată, Radu, Geacu, Sorin, 2000, *Geografi români*, Edit. Semne, Bucureşti.
4. *** (1940), *Arhivele Naţionale Centrale ale României*, Fond Ministerul Instrucţiunii (MI), Dos. 1055/1940, Bucureşti.
5. *** (1940-1943), *Revista Geografică Română*, Bucureşti.
6. *** (1941-1943), *Buletinul Societăţii Regale Române de Geografie (1940-1942)*, Bucureşti.
7. *** (1941-1945), *Arhivele Naţionale Centrale ale României* (ANCR), Fond Ministerul Culturii Naţionale şi Cultelor (MCNC), Dosare: 986/1941, 1299/1942, 2524/1943, 1583/1944, 4375/1945, Bucureşti.
8. *** (1943), *Anuarul Universităţii "Regele Ferdinand I" Cluj-Sibiu, în al doilea an de refugiu 1941/1942*, Tipografia Cartea Românească, Sibiu.
9. *** (1947), *Arhivele Naţionale Centrale ale României* (ANCR), Fond Ministerul Cultelor şi Instrucţiunii Publice (MCIP), Dosar 353/1947, Bucureşti.
10. *** (1979), *Sabin Opreanu*, Revista Terra, X, *2*, Bucureşti.
11. *** (1985), *Prof. Ştefan Manciulea la 90 de ani*, Revista Terra, XVII, *1*, Bucureşti.

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PARTICIPATIVE PLANNING IN THE CONTEXT OF METROPOLITAN GOVERNANCE. A CASE OF CLUJ METROPOLITAN AREA

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ABSTRACT. - Participative Planning in the Context of Metropolitan Governance. A Case of Cluj Metropolitan Area. Public participation became an essential element of the modern governance practice and a norm in the contemporary spatial planning. It is also endorsed as an important component in creating sustainable development and an efficient tool in strengthening legitimacy. Nevertheless, there is also a lack of confidence in management decisions and in political structures as mechanisms to conduct effective strategic governance and to address the needs of various stakeholders in the strategy and policy formulation. The aim of study is to examine how public participation is perceived in the view of different stakeholders in a complex governance setting of a metropolitan area. The findings show that the process of public participation is perceived differently depending on the group of stakeholders and the actual public involvement differs between the rural areas and the urban core. Although public engagement is widely endorsed, there are different views on what this process should comprise. Nevertheless, the question of how far the common citizens actually influenced the spatial development of the metropolitan area, is open for debate.

Keywords*: public participation, metropolitan governance, public engagement, strategic planning.*

INTRODUCTION

Engaging the public in decision-making became an essential element of the planning process and a basic condition in local democracy. According to the traditional post-war planning theory, the planner itself is endowed with

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the ability to produce good quality planning documents that serve the public interest (McKinley *et al*., 2021). However, the second half of the 20th century brought 'a new wave of ideas' that seeks a strategic approach that recognizes the importance of community collaboration founded on the principles of participatory democracy (Healey, 1996) in the field of planning. Additionally, in the last thirty years there was a growing pressure on governments to establish and embrace participative planning into the modern governance practice (Baba *et al*., 2009), hence the participative turn in European democracy received an increased attention. Participation is viewed as a means to achieve an objective in the development activity which demands particular attention from the Member States to encourage active involvement of all interested parties. It is therefore, dependent on the policy context and the local community characteristics. In this perspective, after the regime change, the Central and Eastern European countries were marked not only by substantial political and economic changes but also faced new challenges in terms of socio-spatial organization and spatial planning.

In Romania for example, after the 1990's the transformations in land-use planning driven by change of land property, decollectivisation of agriculture, privatization, deindustrialization processes (Grigorescu *et al*., 2021) marked the turn from socialist mechanisms to the post-socialist neo-liberal initiatives which changed the role of the actors involved in the planning and decision-making processes (Nae *et al*., 2020). This was also induced by the country's accession to the European Union in 2007 and consequently the adoption of the EU's Urban Agenda that brought new challenges in terms of governance especially with relation to the metropolitan-wide integrative planning, development as well as allocation and use of financial resources (Nagy and Benedek, 2021). In relation to this, it is important to mention that the country's EU accession also triggered the initiation of the growth pole program, a top-down initiative that aimed to decrease regional disparities which in spatial terms was translated in the creation of metropolitan areas. From a governance perspective they function under the umbrella of voluntary associations between the urban core and the neighbouring rural communities. Within this setting, participatory planning and consequently, the engagement of citizens in the decision-making processes became imperative for the effective metropolitan planning and development process. This claims not only an understanding of community participation from a conceptual perspective but also empirical investigations of the experiences with citizen participation in planning decisions.

Therefore, our study is based on the case of Cluj Metropolitan Area (CMA) situated in the North-West region of Romania. The CMA is composed by the core city of Cluj-Napoca and 19 adjacent localities divided into two

metropolitan rings. The first metropolitan ring consists of seven communes: Floreşti, Feleacu, Ciurila, Apahida, Chinteni, Baciu and Gilău. The second metropolitan ring is composed by: Aiton, Bonţida, Borşa, Căianu, Cojocna, Gârbău, Jucu, Petreştii de Jos, Săvădisla, Sânpaul, Tureni and Vultureni. The paper is analyzing the perception of different stakeholders in the case of Cluj Metropolitan Area, Romania. It discusses the level of participation in the view of various stakeholders, in enhancing the planning process. It starts with the discussion of participatory planning as a basic condition in local democracy and a tool for effective planning.

The empirical analysis first investigates the stakeholders' perception regarding the level of public participation, whereas the second, the openness of local authorities in the inclusion of the public in the decision-making process. The main findings show that in the stakeholders' view public engagement is perceived as an important element of spatial planning and it is believed that it produces 'better' decisions. Public participation is however more common in the urban setting than in the rural areas of the CMA.

DEFINING PUBLIC PARTICIPATION

Participation and participatory planning are both concepts that refer to the direct involvement of community members where ideas, opinions and concerns of local citizens are collected (Roux and Cillliers, 2013; Baba *et al*. 2009) to form joint decisions (Nared, 2020) and bring about better planning solutions for a sustainable society (Sulemana and Ngah 2012). According to Smith (1973) participation is a form of legitimacy in the decision-making process. This is supported by Hassan *et al*. (2011) who believe that it creates a sense of local ownership and safeguards the citizens' rights. Nevertheless, it is debated whether participatory planning increases the effectiveness of the planning process (Smith, 1973) or it is only a vague commitment to protect and integrate the values of the public, especially if decisions and value judgements are taking place somewhere else in the system (Davies, 2001). As pointed by Moser (1989, p. 84) "in reality it is not the evaluation of participation either as a means or as an end which is important, but the identification of the process whereby participation as a means has the capacity to develop into participation as an end." Participation is not a goal in itself but an instrument that leads to the achievement of an objective (OECD, 2004), it is context-specific and should have a clear purpose. As determined by Nared (2020), in the context of a metropolitan region participation should be addressed in the framework of its governance where planning is formulated as a process of a wide stakeholder involvement with a clear purpose. Just hearing out the voice of the public in the planning process is a scarce attempt to achieve a participative democracy

based on the model of civic engagement (Davies, 2001). Therefore, organizing capacity is considered to be as one of the prerequisites for effective and sustainable governance. For that reason, it is seen as a 'fundamental mediator' which connects the ability of a metropolitan area to identify the occurring challenges with its capacity to effectively act on these (Carvalho *et al*., 2016).

WIDE STAKEHOLDER INVOLVEMENT AND PARTICIPATORY PLANNING

The continuous emphasis placed on the so-called network governance, raises the question of how to bring more actors together on one hand but also how to engage them in identifying and delivering planning goals and objectives on the other (Rydin, 2010). Therefore, to create conditions for sustainable planning and development, a governance arrangement must have such an organizing capacity which provides the ability "to enlist all actors involved, and with their help generate new ideas and develop and implement a policy designed to respond to fundamental developments" (van den Berg *et al*., 1996, p. 1). Hence, as collaborative and cooperative efforts strongly contribute to a more effective and durable regional governance the involvement of a wide range of stakeholders in the regional debate is of great importance (Healey, 1998). Next to this, the steering capacity of these interaction processes is wider if the involved actors are heterogeneous and have various capabilities (Heinelt and Kübler, 2005). As Berg, *et al*. (1993) remarks, the urban processes became so complex, that a government on its own is unable to create a link between the public and the private sectors.

Next to the public and private sectors however, there is a necessity to involve in the metropolitan governance the non-profit sectors as well (Wallis A. D., 1994). Yet, the involvement of a wide variety of stakeholders can raise several constraints especially if no such circumstances are created where a consistent dialog can be achieved. As social relations take place on several levels when involving stakeholders with different levels of authority the subject of stable co-working relationships might be questioned. Consequently, several authors raise the problem of the power dimension which can lead to a greater dominance of some actors (Healey 2003; Kemp *et al*., 2005; Nealer and Naude, 2011). According to Le Galès (2011) the policy instruments themselves are a form of power as in their nature they represent policy settings and issues in specific ways. On the other hand, several scholars believe that it is not possible to equalize power implications (Innes and Booher, 1999). Others, consider that power can be effectively used through the establishment of interconnected networks between various stakeholders where power is achieved through

information, financial resources and granted rights (Kemp *et al.*, 2005, Rydin, 2010). Nevertheless, according to Berg *et al.* (1999) the interdependent relationship between stakeholders is not a premise for balanced power relations because flexibility, trust and openness for cooperation are the factors which define the performance of such networks. On the other hand, another element that is able to confront power relations and enforce the achievement of consensus, is the previously discussed participatory planning (Harrison *et al.*, 2004).

Within the last decades participative approaches gained great attention in the decision-making process especially in the context of achieving sustainability goals. According to Appelstrand (2002, p. 289) public participation is a necessary tool for policy practitioners to "create more qualified operative decisions, provide a more solid base for the final agreement and increase the likelihood of reaching 'sustainable' decisions that consider long-term effects." Next to this, public participation does not only integrate the so called 'local knowledge' about local values, conditions, problems but it also has the ability to lead to potential solutions within a specific area (Healey, 1998; Innes, 1998). The challenge of involving a wide range of public actors is however to find those instruments which lead to a mutual agreement between stakeholders, lower the chances or find solutions for different disputes and result in common agreement (Burby, 2003). Analysis of Harrison *et al.* (2004) for example show that even if new groups are included in the consultation process, the already existent power relations can be deepened or lead to new ones where some groups might be driven by interests that emerge from their professional status and not by their interests as citizens.

We must admit however that the imprecise legal conditions regarding the extent of public involvement in the decision and policy making process (Harrison *et al.*, 2004) impede the success of a structured and multi-stakeholder-based process for reaching consensus. Nevertheless, as pointed by Wheeler (2000), the involvement of the public in a sustainable metropolitan planning is important because it is an expectation of democratic ideals to include the local knowledge and interests of community in urban planning. It is also essential in creating public education, training and building political support for the emerging policy initiatives.

METHODOLOGY

In tackling the main aim of this paper, we were aware that public participation is a context-driven (Narayan, 1995) and its implementation approaches are highly debatable. The primary or preparatory phase included an internal desk research through which relevant sources were consulted

about the topic of this paper. Based on the desk research two main topics were defined: first, the level of public participation in the decision-making process, and second, the openness of the local authorities to involve the public in this process. This gave the basis for the next phase of our research which consisted in interviews with a range of relevant stakeholders.

The second part of the research involves a qualitative approach that consisted in interviews that were semi-structured and followed certain topics where the interviewees had the opportunity to elaborate on their perspectives. The fieldwork for the interviews was conducted between April 2016 and November 2016. All fieldwork was performed by the first author. Based on our desk research we identified four groups of interviewees: decision makers (analysed in two separate groups), civil society representatives, professionals dealing with urban/metropolitan wide planning and representatives from administrative institutions. In order to raise a better contrast, decision maker from the first and second metropolitan ring were analysed as two separate groups.

A total of thirty interviews were conducted out of which fourteen were with decision makers (DM) from separate local authorities of the metropolitan area, six were identified as representatives of the civil society (CSR) working for local NGO's, eight professional experts (PE) such as urban planners, architects, academics, financial consultants and two representatives from administrative institutions (AIR) such as the County Council. Invitation for the interview took place over the phone and anonymity and ethical information was assured. All the interviews were made in person, on-site, audio-recorded and later transcribed, coded and analysed by using Microsoft Excel spreadsheets. Nevertheless, we need to highlight that the study also had some limitations especially regarding the selection criteria. As the main aim was to include a wide range of participants in the study, there is no numerical balance between the professional affiliations of the interviewed stakeholders.

RESULTS AND DISCUSSION

Public participation in the decision-making process

In the first part of our study, we aimed to investigate at what level is public participation perceived by the stakeholders, in the decision-making process within the CMA. Based on our analysis summarized in Figure 1. half of the interviewees considered that the public participates in such initiatives, whereas the other half believed that there is a lack of interest in getting involved in such consultations. Nevertheless, especially decision makers from the first

ring considered that there is no interest from the public to participate at such events. In the case of the civil society representatives and the group of professional experts, opinions were fairly divided. On the other hand, both interviewees working at the Administrative Institutions had an affirmative answer to this question.

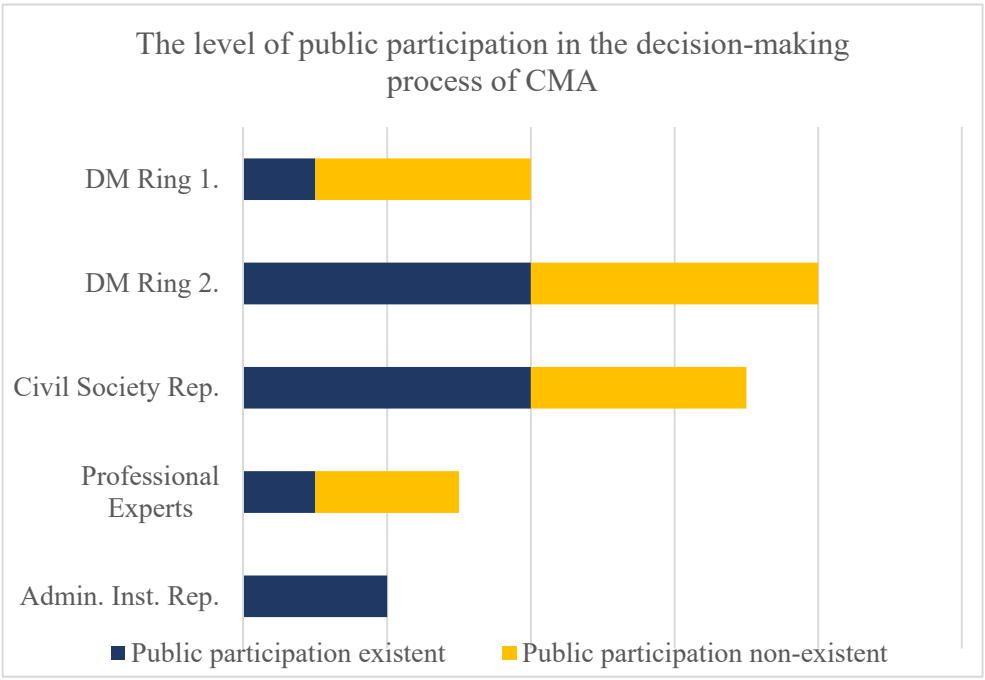

Figure 1. The level of public participation in CMA – from a stakeholder perspective
Source: Nagy, 2019

Several interviewees felt important to point out that when it comes to the public, we must consider what group or segment of population we talk about as their attitude differ from each other depending on factors such as age, education, spatial affiliation, personal interest, availability etc. This remark is well argued also in the literature (OECD, 2004; Hassan *et al.*, 2011; Nared, 2020; McKinley *et al.*, 2021) that public participation is context specific and is highly dependent on the complexity of the setting such as geographical area, demographic variables but also the size and structure of the local administration, political majority. In relation to this, there was a common observation of the interviewees especially active in the urban core, on the fact that opened participative behaviour is more visible at urban than on rural level. This was

attributed to the diverse and dynamic community of the municipality that is more aware of such practices and presents greater openness to participate. It was also pointed however, that "the larger the community, the more divergent interests arise" (AIR1).

Few have pointed that the civil society especially in the municipality "is in continuous formation" and "gets stronger and well-organized", it tightens the openness of the public to participate at planning consultations (AIR1, CSR3). Nevertheless, few representatives of the civil society and professional experts pointed the fact that often times the civil society is not taken seriously enough, this drives them to demotivation and the belief that no matter what they say "it is not going to be considered" (PE1) even though "they are the layer that local authorities should use in mobilizing greater masses" (CSR2, CSR8,). This is an issue that is well supported by Davies (2001) who made the point that only 'hearing' voices in the planning process is insufficient and can't be viewed as participation especially when decisions are made in other parts of the arrangement.

Within the context of the rural areas in CMA, few decision makers felt that inhabitants of rural areas are opened to know what developments are planned and to say their opinion regarding those decisions. According to them "the population is interested as long as you ask them" (DM5), "some are conscientious and interested in development opportunities" (DM8) and "they might be skeptical at first but after a dialog they are glad that they have been consulted" (DM9). Next to this, it was also highlighted that "you have to know to listen to them" (DM5) and "from the multitude of opinions to select" (DM7).

On the other hand, other decision makers experienced that in some communities even if inhabitants participate at such consultations "many are afraid to express their opinion and leave that to those who have a more imposing kind of attitude" (DM4). Next to this, others were on the opinion that in the remote communities the public is more reserved and leave the control of decision making to some leaders such as priests, teachers or mayors because "they know better" (AIR1) or "local administrations use public participation only to confirm to themselves some of the theories" (CSR6).

In addition to this, some interviewees felt that even if there is greater interest to participation on urban level, "in many cases people confuse these consultations with meetings within the Tenants' Associations" (CSR4) and bring up problems that have no relation to the topic of the consultation. In support of this, one interviewee stated that "it is difficult to teach people what participation is about […] to act in a logical manner, to teach them to give feedback in an organized manner and on the discussed subject" (CSR5). Other interviewees felt that "the public does not care how decisions are made" (PE5),

"if they do not have immediate interests, they do not get involved" (DM12), they think that "it is the local councillors' job to represent their opinion" (DM4, DM13) or "they only express their discontent when the project is not implemented in the way they thought it would" (DM2).

Challenges and limitations for public participation

Several arguments were considered by the interviewees to explain the limitations of public participation. The answers are summarized below:

- especially in communities with ageing population it is difficult to inform and mobilize people through digital media
- complexity of planning documents – when the public consultation is regarding the development of a planning strategy, some might not participate as this requires the reading or even studying of the specific strategy
- lack of consciousness "people do not have the consciousness that they are the active parts and have the impression that someone above decides in their place" (CSR1)
- lack or low level of trust in public institutions "the public feels distant by various institutions and is not able to identify itself with the aims these assign" (PE1). According to the interviewee even if the root cause of several problems is present in the awareness of people as well as institutions, the latter ones are not able to communicate in such ways that the public feel that they "speak" about the same problems
- public education and building of trust require long period of time "to launch a process we need at least two mandates and in terms of increasing public participation it would take even four years" as people do not have the exercise of participation" (PE1)
- artificial participative planning "there is a breach between what residents do and what administration does […] yet everyone understands the important role [of local authorities] they play in financing projects and further, of these movements at greater scales" (PE1)

Attitude of local authorities to public participation

In the following section interviewees were asked if they believe that there is a positive attitude of local authorities for a better implication of citizens in the decision-making process. As Figure 2. below shows, most interviewees agreed on the fact that authorities do try to involve the public. Mostly decision

makers from the second ring and representatives of the civil society answered affirmatively to this question. Within the representatives of the administrative institutions, answers were fairly divided and most of the professional experts believed that local authorities do not make enough efforts to involve the public.

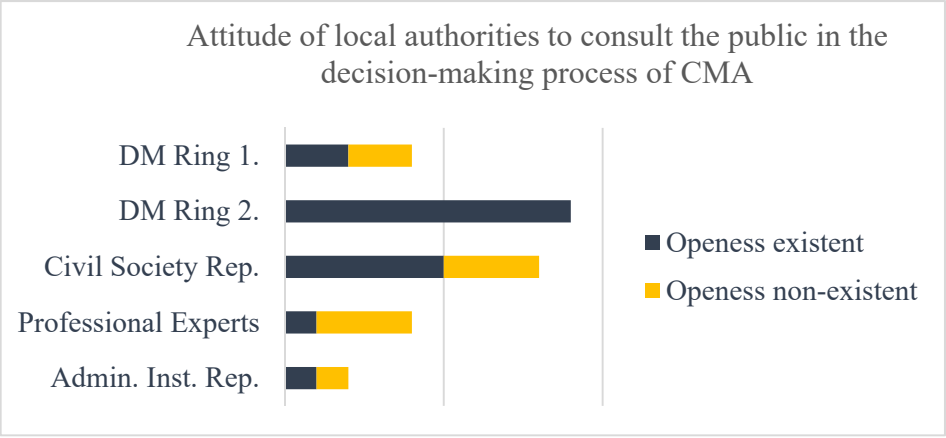

Figure 2. Attitude of local authorities towards public involvement in the decision-making process

As pointed above, all decision makers stated that on local level, they do organize meetings where the public can say its problems and views. Some pointed out that everyone's opinion is important, nevertheless as "it is impossible to respond to every single request, they need to be harmonized and handled in an effective manner" (DM4, DM5). On the other hand, according to an interviewee in order to gain trust of the community "first they have to see that something really materializes" (DM2). In support of this, an example of the local authority of Cluj was given when the civil society's opinion was considered in a project regarding the inclusion of an extra road lane for cars on a busy road that passes through the city centre. According to one of the interviewees this was a successful example which shows that "it is possible to converge the interests of politics with the interests of the citizens" (CSR1). According to a professional expert, it is more and more recognized by the local authorities that in order to make the residents to understand their goals, "they need to bring these questions closer to the public […], yet this is a long process that needs continuous improvement and development" (PE5). There was also a common agreement on the fact that the level of public involvement depends on the local authority "there are localities where the level of involvement is higher, others where the mayor decides" (PE6) or cases when there is no dialog or communication "the connection is very weak" (PE1) between the communities and local authorities.

Most examples given by the decision makers regarding public engagement were connected to the process of spatial plan and strategy formulation. Nevertheless, few interviewees pointed out that these meetings are compulsory in such procedures, as local authorities need to organize such public consultations when producing development strategies and plans. In addition, some professional experts were on the opinion that these strategies are already made and people are purely put in front of a statement of facts. The impediment was believed to be the fact that local authorities are the ones who reimburse the making of these strategies – usually by private companies – therefore, these are made in a way that firstly satisfy the interests of the procurer. This issue has also been revealed by Healey (1996) who argued that in strategic planning discussions often take place after these have been articulated when politicians or experts have already 'invented' the strategic ideas.

Relationships established between the stakeholders involved in participatory planning in CMA

Drawing on the findings of our analysis and to highlight the level of interaction established between all relevant stakeholders involved in the participatory planning of Cluj Metropolitan Area, the following relationships were observed (Fig. 3.):

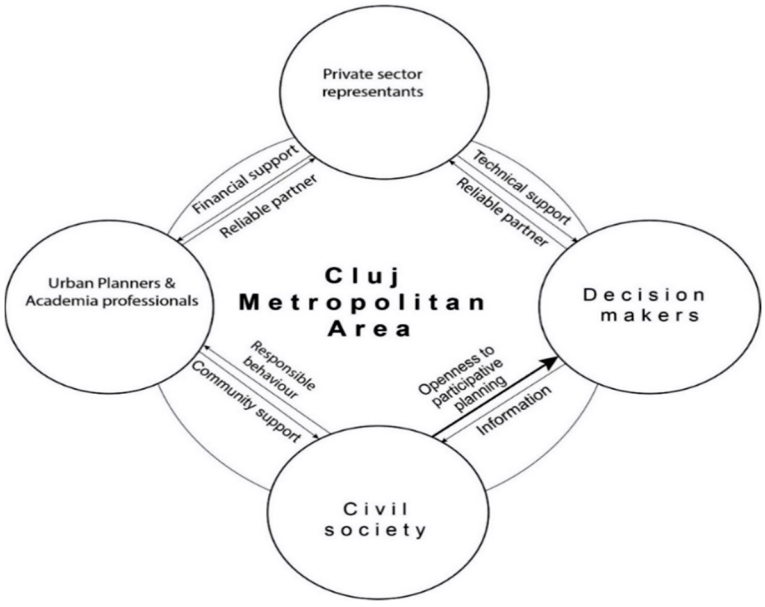

Figure 3. Relationships established between stakeholders involved in the CMA's participatory planning

- participative planning approaches are most welcomed by the civil society representatives who expressed their intention to be informed, consulted, and involved in any decision related to their quality of life.

- in practice, some relationships based on collaboration are translated in technical or financial support sustained by the local representatives of the private sector or the professional experts (academia, urban planners, architects, etc.).

- the most common relationships are supportive in their nature and can be assigned to the decision makers; in their opinion, the inhabitants and the NGOs must be informed for any major decision or project related to CMA; the private and professional environment are considered to be reliable partners when involved as responsible entities for development or planning studies or even some specific projects.

CONCLUSIONS

The study provides a comprehensive overview of the findings on the role of public participation in the decision-making process of Cluj Metropolitan Area, that was obtained from interviews with various stakeholders such as decision makers, planners, academics, representatives of the civil society, of administrative institutions and of the private sector.

Based on our analysis, it was determined that the culture of participative planning varies between the urban and rural communities of the metropolitan region with an increased openness and greater visibility in the urban core.

It was also determined that the level of participatory approaches -both participation and engagement- are much dependent on the locally specific context with the sense that what works in one situation may not be appropriate in another. Every context has distinctive power relations, social and economic realities that influence the capacity to effective public participation. In terms of a metropolitan region however, participation should also be discussed within the context of metropolitan governance whereby a wide variety of stakeholders bust be involved in the decision-making process, in the managing and developing plans and strategies. Therefore, supportive conditions must be created for networking to function. It is important that decision makers and planners with their expertise, experience and knowledge play the role of facilitators and create a link between various types of stakeholders and create settings where participation is not only an instrument to express problems but also an instrument to reach possible solutions.

The paper argues that even though the concept of participation is well-known in the views of planning and decision-making practitioners, the degree that it is effectively used, is quite low. According to our study in various cases public engagement is only used at an advanced stage, when ideas and plans are in their ending form. Another important finding is that the various backgrounds of the stakeholders drive them to play various roles in the participation process. Participative planning approaches are most welcomed by the civil society and the relationships built on collaboration are mainly characteristic to the representatives of the private sector and professional experts with higher emphasis on financial or technical support.

Therefore, it is important that each member knows its role and there is a balance in meeting everyone's interests. A greater institutional transparency about the process of public participation but also about the end results of such initiatives would increase trust and facilitate better involvement by the public. The participatory process is largely dependent on trust between those who initiate, participate and those who implement.

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REFERENCES

1. Appelstrand, M. (2002), *Participation and societal values: the challenge for lawmakers and policy practitioners.* Forest Policy and Economics, 4, pp. 281–290.
2. Baba, C., Chereches, R., Mora, C., Ţiclău, T. (2009), *Public Participation in Public Policy Process – Case Study in Seven Counties from North-Western Region of Romania*. Transylvanian Review of Administrative Sciences, 5. pp. 5-13.
3. Burby, R. J. (2003), *Making Plans that Matter: Citizen Involvement and Government Action*. Journal of the American Planning Association, 69(1), pp. 33-49.
4. Carvalho, A., Pinto-Coelho, Z. Seixas, E (2019), *Listening to the Public – Enacting Power: Citizen Access, Standing and Influence in Public Participation Discourses*, Journal of Environmental Policy & Planning, 21(5), pp. 563-576.
5. Davies, A.R. (2001), *What Silence Knows - Planning, Public Participation and Environmental Values*. Environmental Values, 10(1), pp. 77-102.

6. Grigorescu, I., Dumitrica, C., Dumitrașcu, M., Mitrica, B., Dumitrașcu, C. (2021), *Urban Development and the (Re)use of the Communist-Built Industrial and Agricultural Sites after 1990. The Showcase of Bucharest–Ilfov Development Region*, Land, 10, 1044.
7. Harrison, C. M., Munton, J. C., Collins, K. (2004), *Experimental Discursive Spaces: Policy Processes Public Participation and the Greater London Authority*, Urban Studies, 41(4), pp. 903–917.
8. Hassan, G. F., Hefnawi, A., Refaie, M.E. (2011), *Efficiency of participation in planning*. World Pumps, 50, pp. 203-212.
9. Healey, P. (1996), *The Communicative Turn in Planning Theory and its Implications for Spatial Strategy Formation,* Environment and Planning B: Planning and Design, 23(2), 217–234.
10. Healey, P. (1998), *Building institutional capacity through collaborative approaches to urban planning*, Environment and Planning, 30, pp. 1531 - 1546.
11. Healey, P. (2003), *Collaborative planning in perspective,* Planning theory, 2(2), pp. 101–123.
12. Heinelt, H., Kübler, D. (2005), Metropolitan Governance in the 21st Century: Capacity, Democracy and the Dynamics of Place, London : Routledge.
13. Innes , J. E., Booher, D. E. (1999), *Consensus Building and Complex Adaptive Systems*. Journal of the American Planning Association, 65(4), pp. 412-423.
14. Innes, J. E. (1998), *Information in communicative planning*, Journal of the American Planning Association, pp. 52-63.
15. Kemp, R., Parto, S., Gibson, R. B. (2005), *Governance for sustainable development: moving from theory to practice*, International Journal of Sustainable Development, 8(1), pp. 12-30.
16. Le Galès, P. (2011), Policy Instruments and Governance. In: *The SAGE Handbook of governance,* SAGE Publications Ltd.
17. McKinley, E.E., Fredriksson, A., Syssner, J. (2021), "Opening the black box of participatory planning: a study of how planners handle citizens' input." *European Planning Studies*, pp. 1-19.
18. Moser, C. O. N. (1989), *Community participation in urban projects in the Third World*, Progress in Planning, 32(2) pp. 71-133.
19. Nae, M., Dumitrache, L., Suditu, B., Matei, E. (2019), *Housing Activism Initiatives and Land-Use Conflicts: Pathways for Participatory Planning and Urban Sustainable Development in Bucharest City, Romania,* Sustainability, MDPI, 11(22), pp. 1-26.
20. Nagy, J.A. (2019), Sustainable development in the Metropolitan Area of Cluj-Napoca (Dezvoltare Sustenabilă în Zona Metropolitană Cluj-Napoca România) (Accession No. F-CA-18993/23.01.2019) [Doctoral dissertation, Babeş Bolyai University, Cluj-Napoca]. Ministry of National Education. UEFISCDI.
21. Nagy, J. A., Benedek, J. (2021), *Can the EU Cohesion Policy fight peripheralization?,* in Rauhut, D., Sielker, F., and Humer, A. (eds) EU Cohesion Policy and Spatial Governance: Territorial, Economic and Social Challenges. Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing
22. Narayan, D. (1995), *The Contribution of People's Participation: Evidence from 121 Rural Water Supply Projects*, ESD Occasional Paper Series 1, World Bank.

23. Nared J. (2020), *Participatory Transport Planning: The Experience of Eight European Metropolitan Regions.* In: Nared J., Bole D. (eds) Participatory Research and Planning in Practice. The Urban Book Series. Springer, Cham.
24. Nealer, E. J., Naude, M. (2011), *Integrated co-operative governance in the context of sustainable development*, Td: the Journal for Transdisciplinary Research in Southern Africa, 7(1), pp. 105-118.
25. OECD (2004), *Effectiveness of Participatory Approaches: Do the New Approaches Offer an Effective Solution to the Conventional Problems in Rural Development Projects?*, Organisation for Economic Co-operation and Development, Operations Evaluation Department, 142 p.
26. Roux, J. H. L., Cilliers, E. J. (2013), *The participatory planning paradigm shift: Comparing disciplines and methods*. In: 49th ISOCARP congress, 20.
27. Rydin, Y. (2010), Governing for sustainable urban development. London: Earthscan.
28. Smith. R. W. (1973), *A Theoretical Basis for Participatory Planning*, Policy Sciences, 4(3), 275–295.
29. Sulemana, M., Ngah, I. (2012), *Participatory planning: ending the controversies*, European journal of social sciences, 28, pp. 24-34.
30. Van den Berg, L., Braun, E. (1999), *Urban Competitiveness, Marketing and the Need for Organising Capacity*, Urban Studies, 36, pp. 987-1000.
31. Van den Berg, L., Braun, E., Van der Meer, J. (1996), *Organising and Implementing Major Metropolitan Projects,* ETH Zurich, Switzerland, 26-30 August 1996.
32. Van den Berg, L., Van Klink, H. A., Van der Meer, J., European Institute for Comparative Urban Research (1993), Governing metropolitan regions, Aldershot: Avebury.
33. Wallis, A. D. (1994), *The Third Wave: Current trends in regional governance*, National civic review, 83(3), pp. 290-310.
34. Wheeler, S. M. (2000), *Planning for metropolitan sustainability*, Journal of planning education and research, 20, pp. 133-145.

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THE IMPACT OF THE INDUSTRIAL CULTURAL LANDSCAPE CONVERSION THROUGH TOURISM ON THE ENVIRONMENTAL ELEMENTS OF OCNA MUREȘ

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ABSTRACT. – The Impact of the Industrial Cultural Landscape's Conversion through Tourism on the Environmental Elements of Ocna Mureș. The fulminant technological advance, corroborated with the increasing demand of products have favored, in the recent period, the accentuation of the various processes of environmental pollution, with particularly serious consequences on the living organisms. Thus, the European Green Pact is the instrument through which the European Union wants to establish the necessary steps to reduce air, water and soil pollution (by 2050), as the main elements of the environment affected by pollution. It is therefore recommended that the quality standards provided by the international forums be respected and that the specific legislation of all member states be aligned for a unified approach. In this regard, the implementation of the clean industrial technologies, recycling, the use of green energy in the production process, the use of natural resources in a sustainable manner or the conversion of industrial elements into tourism elements, can be viable means to achieve the goals proposed in the pact. In the context of those presented, this study seeks to argue the conversion of the industrial cultural landscape related to the exploitation and processing of local salt resources and the specific hazards, found at Ocna Mureș (Alba County), in the cultural and tourist-validated landscapes. The change of the function of the mentioned elements can favour the socio-economic revival of the area, with the observance of the new European environmental norms, in the medium and long term.

Keywords: *Ocna Mureș, salt resources, hazard, tourism, sustainable development, Industrial Cultural Landscape, conversion .*

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1. INTRODUCTION. THE CONVERSION: INDUSTRIAL CULTURAL LANDSCAPE - TOURISM. GENERAL ASPECTS

According to the general meaning, "the cultural landscape is a physical surface with natural features and elements modified by human activity, residing in patterns, stratified arranged in the landscape, which gives the place its particular character reflecting human relations with the landscape and the attachment to it" (J. Lennon, S. Mathews, 1996, p. 3). This type of landscape reflects the general historical dynamics of the global society in general, and the local one in particular, and is "constantly changing due to the ecological processes and the social forces that act on it" (M. Jones, 1991, p. 231). In this order of ideas, Marcucci (quoted by Ileana Pătru-Stupariu, 2011, p. 103) considers that the cultural landscape "must be viewed from the perspective of temporal evolution, as it is a legacy of the past, but must also be viewed from the perspective of the future, in a bivalent relationship. On the one hand, the exact knowledge of the historical landscape conditions and of the changes occurred in time can facilitate and improve the predictions about the current and future state of the landscape and can generate scenarios for the future".

This way, we can state that the transformation of the natural landscape into a cultural one and later, the meaning of the evolution of the latter, are inscribed as a consequence of the sum of the changes introduced by man within the landscape. The number of changes and the intensity with which new anthropogenic elements were introduced in the territory, depended on natural or human factors such as: actions taken by man to meet basic needs, positive demographic evolution, technical-scientific progress, economic and political framework, etc. (Camelia-Ina Gavra, 2013, p. 137).

The various changes produced by man over time, in terms of natural components of the landscape can be grouped in various categories, depending on the type of activities carried out by it, according to Camelia-Ina Gavra (2013, p. 137). In the case of the present study, the visibly dominant category is the industrial one, the existence of salt resources in the Ocna Mureș area and their exploitation continues, imposing the appearance of various industrial elements over time and shaping a cultural landscape with specific function.

At a general level, Claudia Popescu (1990, p. 57) points out that "the industrialization manifests a multitude of trends with accentuated or slow evolution, with convergent or contradictory meanings, actually synthesizing the adaptability of the industrial system and, implicitly, the proof of its viability", but "the most important in content and significance is the trend of industrial restructuring (in this case we propose the conversion through tourism). In a systemic approach this means rearrangement and reorganization of structural elements and a redirection of the economic and social relations between them".

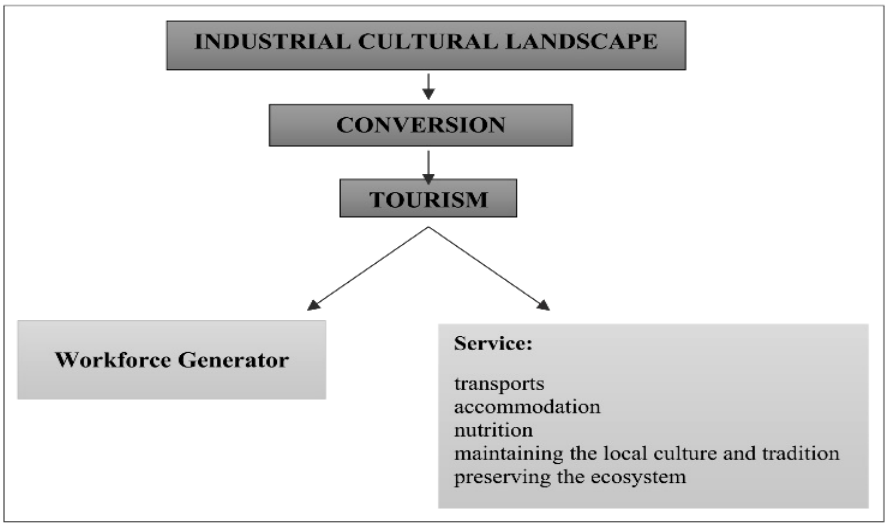

Fig. 1. The role of conversion. *Source: the author*

In this context, the conversion of the economic function, according to current trends and needs, can ensure the continuity of the existing cultural elements and the local social and economic prosperity, the opportunity to adopt the tourist function being desirable. "Thus, the phenomenon of interface and complementarity appears with mutual environmental, economic and social benefits" (P. Cocean, Nicoleta David, 2014 p. 87), regarding the conservation of the industrial cultural landscape through tourism conversion, exploitation of the local salt resource and use for tourism purposes, enrichment with new necessary cultural elements, related to transport, accommodation, public alimentation, perpetuation of local culture, ecosystem preservation, etc. (fig. 1).

2. OCNA MUREȘ. LOCATION AND PHYSICAL-GEOGRAPHICAL CHARACTERISTICS

The analysis of the topographic map reveals the location of Ocna Mureș town in a meadow hilly area in the north-eastern part of Alba County, on the left bank of the Mureș River middle course. The western limit of this particular location is determined by the Alba Iulia – Turda Corridor, the Mureș Corridor, the south-western by the Ciunga Hills (Nejoapa Hill), and the southern one by the top of Banța Hill. From an administrative point of view, the town includes, in addition to the actual urban area, the following localities: Uioara de Sus, Uioara de Jos, Cisteiu de Mureș, Micoșlaca and Războieni-Cetate.

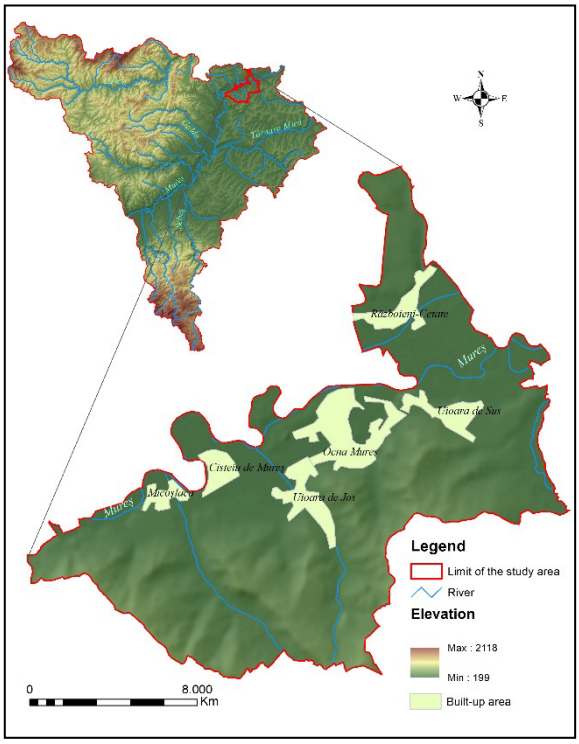

Fig. 2. Ocna Mureş City Map. *Source: the author*

The diversity of landforms noticeable in the delineated area proves to be closely related to the geographical position. The vicinity of the Transylvanian Plain and the Târnave Plateau, along with the presence of the Mureș River require the existence of a relatively varied relief. The most visible forms are the hills and the plateau, accompanied by the plethora of the fluvial microforms, created by Mureș River.

Thus, "a hilly crown bypasses the city in a semicircular shape from South-West to North-East, highlighting the Nejoapa Peak - at the border between Ciunga and Ocna Mureș - with extensions to the Banța Hill whose summit is Gurguleu Peak (524 m, the highest altitude of the territory). The Banța Hills present on their peak the vast Larga Plateau, whose eastern edges are supported by the Șpălnaca plains. The heights of Banța and Nejoapa close a wide valley between them, which extends downwards from South to North, slipping at the foot of the forest, under the Gurguleu Peak" (N. Dobra, 1996, pp. 7-8). At the same time, the geographical positioning and the relief are factors in determining a favourable natural environment. The climate of this region is a transition

moderate continental one, under the influence of westerly winds, with the local manifestation of the foehn wind during spring, a warm wind that causes the sudden melting of the snow and sometimes flooding.

The drainage network is dominated by the Mureș River, with a meandering course, accompanied by meadows and terraces, along with other specific microforms (rings, landslides, gullies, torrents, etc.). The existing anthropogenic salt lakes (the Roman mines lake, the Iosif, Francisc, Ferdinand lakes, etc.) owe their appearance to a natural hazard. The flood of Mureș in 1913 caused the waters to overflow and flood the mines exploited since ancient times in galleries. The collapse of the salt mine ceiling thus determined the formation of the anthroposaline lakes.

Regarding the pedological layer, "on the right bank of the Mureș, as well as in the neighbouring area of Fărău, the regosols can be noticed, in the actual built-up area of the town, the clayey soils, formed by repeated overflows, are closely linked to the Mureș Corridor" (N. Dobra, 1996, p. 9). The bedrock houses considerable reserves of salt, which can be exploitable.

Also, the field research highlights the existence of various spontaneous flora and fauna, related to the altitude and landforms mentioned above. This includes blackthorn shrubs (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), rosehip (*Rosa canina*) and deciduous shrubs such as carob tree (*Ceratonia siliqua*), oak (*Quercus robur*), walnut (*Juglans regia*) at higher altitudes, and mixed with pine conifers (*Pinus sylvestris*), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), rosehip (*Rosa canina*) and others. The studied area is, in itself, a living environment for a fauna specific to the area of meadow, steppe and forest-steppe dominated by insects, birds and related game fauna.

Summarizing, the conditions of high favourability, conferred by the natural environment and especially the existence of the salt resource, led to the early humanization of this territory and to the gradual shaping of an industrial cultural landscape through the continuous addition of specific elements. Recent economic changes that have led to the decline of the local economy can be the germ of socio-economic recovery by converting the cultural landscape mentioned into a tourism-related one.

3. THE EXPLOITATION AND PROCESSING OF THE SALT RESOURCES: DETERMINANT FACTORS OF THE CONVERSION OF THE INDUSTRIAL CULTURAL LANDSCAPE INTO TOURISM

Salt was the defining natural element that represented a factor of social development and that shaped the appearance of the area over time. Salt was exploited through various techniques until now, "the mines in this land being functional about 1200 years before our era" (according to N. Dobra, 1996, p. 55).

The long history of salt exploitation in galleries was interrupted in 1913, when the waters of the Mureș River broke the dam that protected the town and the mines. Natural hazard (flooding) has led to imminent technological hazard. The penetration of flood waters into the galleries subsequently caused the collapse of their ceiling and the formation of specific lakes (anthropogenic salt lakes) and forced the adoption in 1952, for the first time in the national salt extraction method, on the principle of wells, the cultural landscape being enriched with two new elements.

Fig. 3. The wells field and the salt lakes from Ocna Mures.
Source: the author

The man is therefore able to slow down or remove almost all the processes of degradation of the landscape and to reconstruct it, even if not in its original form, but in one that is useful and pleasant to him (D. Teaci, 1983, p. 26). The therapeutic potential of salt water did not remain untapped, the high concentration of sodium chloride mineral waters being used for cure and treatment, first in a rudimentary way, then, starting from 1910, in properly arranged baths. The progressive economic decline of the area led to the blurring of this activity, until its total extinction.

Currently, following the partnership concluded between Alba County Council and Ocna Mureș Town Hall for the future baths, the works for the realization of a tourist complex have started, which will include leisure facilities, fitness rooms, restaurant, wellness, treatment rooms, as well as spaces for sporting activities; all these having as purpose the invigoration from the tourist, balneary and, not in the least, the economic point of view of the town of Ocna Mureș, according to the urban project.

4. THE IMPACT OF THE CONVERSION WITHIN THE INDUSTRIAL CULTURAL LANDSCAPE

The conversion supposes, in this case, a natural continuation of the dynamics of the elements of the cultural landscape imposed by the perpetually natural-anthropogenic dual manifestation. In this context, the appearance of the salt lakes, as a result of the chain manifestation of a natural hazard (floods), followed by a technological one (collapse of the salt mine ceiling), may underlie local socio-economic development by converting the function of the industrial cultural landscape into a tourism-related one, using the salt resource for the same purpose. The social factor is thus decisive in assigning the function of the cultural landscape, according to the changes in the analyzed system.

We consider the conversion of the industrial cultural landscape into a tourism-related one as appropriate, in line with the current development trend of the tertiary economic sector (of services), which can be achieved in accordance with the provisions of the above-mentioned environmental pact.

The environmental impact assessment procedure is preceded by an initial project assessment carried out by public authorities for environmental protection which establishes the need to start the environmental impact assessment procedure and/or the appropriate assessment procedure, taking into account some vulnerabilities related to the instability of some areas in the immediate vicinity of the lake surfaces.

The implementation of the tourism development project described above can be an "eloquent example of how the man can transform the landscape for his own benefit, beautifying it, but also making it to produce hundredfold, in terms of value, compared to the old state of things" (D. Teaci, 1983, p. 92), thus, contributing to their own development due to the permanent ability to adapt to changes in the system.

In order to be able to highlight the implications that arise from the conversion on the environmental elements, it is necessary to expose the deficient aspects that the industrial cultural landscape currently faces. These are strictly related to the exploitation of salt, which "made the micro-relief in the exploitation area and a part of the old built-up area of the settlement from near the mines undergo great changes, there appearing numerous excavations, land fractures of the most varied shapes and dimensions" (Al. Vigh, 2011-2013, pp. 14-15). According to the same author, these forms can be classified into several types. The artificial excavations are traces of the daily exploitation of the salt in the southern part of the massif with depths of 10-15 m, where there was the so-called "Roman quarry". Collapse basins are real craters with vertical walls with a depth between 70 and 100 m. The most recent vertical collapse took place on December 22, 2011, forming a real crater, due to the collapse of several galleries of a former salt mine flooded with water, covering an area of 8,000 m^2 and having a 16 m depth, which swallowed the supermarket in the area and a portion of 200 meters of road. There are also large landslides, covered with alluvial deposits, which are found in the North-East. In recent years, in this area there have been numerous land fractures in small but dense sizes, in the form of sinkholes and pits and land fractures with different depths, which generated sinkholes that appeared after the dissolution of the salt. As far as salt lakes are concerned, they cannot normally be arranged for cure and treatment due to the instability of the soil around them, implying the risk of collapse in the event of large-scale works. However, there is the possibility of using them as specific cultural elements in the local tourist ensemble.

"Tourism, seen in terms of the complexity of the factors involved, can have positive effects on the economy as a whole in two ways: it contributes to the emergence and development of new specific economic activities (leisure, craft production, etc.), and increases the volume of activity within the existing economic branches (agriculture, food industry, construction, transport, cultural services, etc.)" (Capar Roxana Aybuke, 2017, p. 27). However, the desired economic development must be correlated with the meaning of the evolution of natural and anthropogenic elements in a sustainable dynamic balance, in line with global trends in environmental protection.

The approach of the industrial cultural landscape analysis is natural to end with a brief exposition of the main elements of favourability, the disadvantages, the opportunities that may arise in this case and the threats related to them, all in a SWOT analysis (see table 1).

Table 1. SWOT Analysis

STRONG POINTS	WEAK POINTS	OPPORTUNITIES	THREATS
The existence of natural resources (salt water, salt) suitable to be exploited; The tradition of using salt in cure and treatment; Easy accessibility through the connection provided by rail and road.	The risk of collapse and land falls of some parts of the walls or ceilings of mines; Lack of promotion of the local cultural landscape; Interruption for a relatively long period of the care treatment services provision.	The possibility of using the salt resource in therapeutic and prophylactic treatment; Attracting new investors in the area; The elaboration of specific strategies for the development of the existing cultural landscape; The development of other types of tourism with potential in the area (ecotourism); Promoting the local cultural landscape.	The poor economic development of the area; The lack of specialized tourism staff; The degradation of the industrial cultural landscape (by abandoning the component elements); The legal restrictions arising from the dependence on budgetary funds.

Source: the author

5. CONCLUSIONS

Thus, "there are considerable arguments that the tourism conversion of the industrial cultural landscape can be a viable alternative for development. The implications on the destination area (meaning the local community and the space on which it is located) are complex. In addition to revenues that can contribute to the economic growth, one can also discuss about the substantial contribution to the preservation of traditional cultural heritage and the natural patrimony" (Dinu Mihaela, 2005, p. 169). The change of the function of the mentioned elements can also favour the socio-economic revitalization of the area, with the observance of the new European environmental norms, in the medium and long term.

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REFERENCES

1. Anghel, Gh., Măhăra, Gh., Anghel Emilia (1982), *Alba, Ghid turistic al județului*, Editura Sport-Turism, București.
2. Capar, Roxana Aybuke (2017), *Impactul turismului în strategia de dezvoltare a orașului Ocna Mureș,* Lucrare de Licență, Universitatea „Babeș-Bolyai", Facultatea de Geografie, Cluj-Napoca.
3. Cocean, P., Vlăsceanu, Gh., Negoescu, B. (2003), *Geografia generală a turismului*, Editura Meteor Press, București.
4. Cocean, P., David Nicoleta (2014), *Peisaje culturale*, Editura Risoprint, Cluj-Napoca.
5. Dinu Mihaela (coordonator) (2005), *Impactul turismului asupra mediului: indicatori și măsurători,* Editura Universitară, București.
6. Dobra, Nicolae (1996), *Ocna Mureș, monografie*, Tipărit la S.C. ALTIP S.A., Alba Iulia.
7. Gavra Camelia-Ina (2013), *Peisaje culturale în Munții Metaliferi*, Editura Risoprint, Cluj-Napoca.
8. Grecu Florina (2006), *Hazarde și riscuri naturale*, ediția a III-a cu adăugiri, Editura Universitară București.
9. Ionescu, Al. (coordonator științific), (1974), *Populația și mediul înconjurător*, Editat în colaborare cu Casa județeană a corpului didactic Deva.
10. Jones, M. (1991), *The elusive reality of landscape. Concepts and approaches in landscape research,* Norsk geogr. Tidsskr. Vol. 45, 229-224. Oslo.
11. Lennon J., Mathews S, (1996), *Cultural Landscape Management. Guidelines for identifying, assessing and managing cultural landscape in the Australian Alps national parks. Cultural heritage working group* – Australian Alps Liaison Committee.
12. Pătru-Stupariu, Ileana (2011), *Peisaj și gestiunea durabilă a teritoriului*. Editura Universității din București.
13. Popescu Claudia (1990), *Tendințe actuale ale procesului de industrializare pe glob*, în Terra, Revistă a Societății de Geografie din România, Anul XXII (XLII), Nr. 1 – 4/1990.
14. Teaci, D. (1983), *Transformarea peisajului natural al României*, Editura Științifică și Enciclopedică, București.
15. Vigh, Al. (Seria 2011-2013), *Ocna Mureș studiu geodemografic,* Lucrare metodico-științifică pentru obținerea gradului didactic I, Universitatea Babeș-Bolyai Cluj-Napoca, Departamentul pentru pregătirea personalului didactic, Facultatea de Geografie.
16. ***https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_ro.
17. ***http://www.ahgr.ro/media/117069/managementulriscului.pdf.
18. ***https://alba24.ro/foto-complexul-balnear-de-la-ocna-mures-ar-urma-sa-primeasca-primii-turisti-in-2021-cum-va-arata-709991.html.
19. ***https://www.academia.edu/36189403/Conversia_cladirilor_industriale_tipuri_de_interventii_si_resuscitarea_cladirilor_moarte_docx.
20. *** https://romaniaexplore.com/salina-ocna-mures/.

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ELEMENTS AND ASPECTS OF COHESION IN THE TOURISM OF SĂLAJ COUNTY

ROZALIA BENEDEK[1]

ABSTRACT. - Elements and Aspects of Cohesion in the Tourism of Sălaj County. This present research highlights leisure time, through the potential of various cultural resources, offered and practiced throughout history in the current perimeter of Sălaj County. The sites of human settlements in the studied area show that the inhabitants of these lands have found a favorable place here to form developed communities, which is an important perspective in describing the topics covered. The tourist activity is getting amplified at county level also due to the strategies undertaken by the Tourist Information Centers. They are involved in organizing and developing events for promotion and capitalization, offering new perspectives for certain traditional activities, which in their absence would risk being lost due to lack of profitability. Thus, tourism receives a cohesive character, determining the maintenance of local values and their transformation into economic goods. The centers with the highest degree of cohesion are those in Zalău and Șimleu Silvaniei, which have managed to develop a tradition of annually organized festivals.

Keywords: *leisure time, tourism, history, cohesion, Sălaj, Șimleu Silvaniei, Zalău.*

1. INTRODUCTION

The recreational activity is strictly related to leisure time and availability. But in different historical contexts, free time has meant something different for every culture and for every social level.

In this article, I propose to review only a few historical and geographical landmarks of Sălaj County, identifying the potential cohesive force of tourism in the possible maintenance of local values, leaving room to a broader debate for a future approach.

Today's tourism is defined as a distinct economic branch, which develops globally by engaging all environmental components and factors of production. Therefore, tourism activity becomes essential in the elaboration of development and spatial planning policies, shaping a harmonious and sustainable development

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(Ciangă & Dezsi, 2007; Treaty of Lisbon, Article 174). The topic of this approach will include, in the first part, the perspective of leisure time and formal visits, carried out in the studied historical-geographical space.

2. METHODOLOGY

The research methods in the realization of this article, serve the authentic presentation of the main aspects of the formation of the tourist culture, identifying the leisure activities as the first forms of tourist activity. Thus, we resorted to the use of the following research methods:

- The documentary and legislative study is used to provide anchored support in the general and particular concepts of the presented topic;
- The historical-geographical description gives the article the identification of the space on the two levels of the research, locating the spatial and temporal axes of the interpretation of the problem;
- The statistical presentation presents the comparative dimension of the debated topic, allowing a qualification of Sălaj County on the palette of the North-West Region of Romania, highlighting the missing interregional elements;
- The applied qualitative research allows the differentiation of the evolution phases of the economic cohesion through the tourism promotion activities, listing the main manifestations transformed into festivals that attract visitors to the localities in Sălaj County.

3. GENERAL ASPECTS OF THE COUNTY AND TOURISM SPECIFICITIES

The administrative-territorial unit of Sălaj County is located in the center of the North-West Development Region of Romania, covering an area of 3864 km^2, which represents a percentage of 11.3% of the area.

The central geographical position of the county was not enough to determine a polarizing economic development, being surpassed by the counties of Cluj, Bihor, Maramureş, Satu Mare and Bistriţa-Năsăud. This ranking is also due to the fact that the localities in Sălaj County are predominantly rural, with a long agricultural tradition, and other poorly developed economic sectors.

From the point of view of the tourism sector, Sălaj County has a number of aspects that are not yet valued, or not properly exploited. Out of the total of the 23 existing tourist information centers, only those in Zalău and Şimleu Silvaniei fulfill a national status, while the other institutions function only as departments of the territorial administrative units, fulfilling the role of promoters of local tourism and instrument of local socio-cultural cohesion.

The National Center for Tourist Information and Promotion in Zalău (www.turismzalau.ro), mainly addresses the county seat, but organizes various events that involve close collaboration with other localities, such as festival events: "Come to us! Open the dowry box from Sălaj".

Also through the activity of the Tourist Information Center from Zalău, a series of four events are organized with the title "Circuit of the seasons", which involve circuits on four different routes in each season, including objectives, activities and attractive communities.

The town of Şimleu Silvaniei, located at the foot of Magura Hills, offers a potential in terms of developing a mountain agrotourism activities, with hiking and outdoor activities. The National Center for Tourist Information and Promotion of the town (https://cniptsimleu.ro/), organizes the medieval festival "Báthory Fest", attracting participants from Poland, Lithuania, Belarus, Hungary, Slovakia and other countries.

The synagogue in Şimleu is part of the local tourist circuit, being transformed into the Holocaust Memorial Museum of Northern Transylvania, attracting especially the school population in the region, but also many citizens from Israel and the USA. The centers for information and promotion of tourism in the rural area of Sălaj County, include a series of historical, culinary and ethnographic values, such as: houses and folk traditions found in Plopiş, Valcău de Jos, Buciumi, etc.; the house of Iuliu Maniu in Bădăcin; the Porolissum Roman camp in Mirşid; the vine culture represented by the wineries in Camăr, Carastelec and the traditional cellars in Şamşud, Zăuan, Crasna, Vârşolţ, Sărmăşag, Boghiş and Nuşfalău; the wooden churches in Creaca, Hida, Sălăţig; Gothic-style Protestant churches, which are found in most localities; the thermal baths in Boghiş.

In general, it can be mentioned that at the county level, local tourism has received a positive boost due to specially arranged places, but also due to the appearance of restrictions imposed by the pandemic, looking for nearby destinations with short programs, one day stay or for an end of the week programme.

4. ELEMENTS OF HISTORICAL IDENTITY - VISITS AND LEISURE TIME ACTIVITIES

The current perimeter of Sălaj County has a rich history in terms of the development of ancient civilizations, including prehistoric sites, legends about dragons, forgotten trails, abandoned mansions, re-equipped castles and many people who with their smile restore the charm of multiethnic and multicultural civilizations.

The tourism of Sălaj County is a living one, managing to attract throughout history various personalities who stopped or spent the night at the noble courts, enjoying the hospitality of the hosts and the beauty of the area.

It is difficult to establish exactly how and when the first forms of tourism-like activities began to develop. However, we can assume that the first visits, which included leisure programs, are identified with the development of the native Dacian civilization. According to the customs of the time, they made regular visits to strengthen their political, military, religious or family relations.

The victories of the Roman wars, during the reign of Emperor Trajan, started waves of Romanization of the lands of Sălaj County. Therefore, the transport infrastructure has undergone a wide development, attracting merchants, central authorities, doctors, craftsmen and cult figures. On the occasion of the various holidays, in the arena of the amphitheater at the Porolissum camp, games, competitions, celebrations and other events were organized to honor the visitors. The memory of these times is capitalized and promoted through the involvement of the Tourist Information Centers in Zalău, Mirșid and Creaca.

The mountainous areas of the Sălaj lands strategically ensured the development of some fortifications, maintaining the development of a degree of civilization for the people who settled on this territory. If the camp of Porolissum was a Roman fortification, then the heights of the nearby hills provided the place for the fortified settlements of the Dacians, who learned to live and maintain themselves despite elements of Romanization. This heritage is a valuable resource for the Tourist Information Center in Șimleu Silvaniei, through the Dacian fortress Dacidava.

The peaks of Măgura Hills near Șimleu Silvaniei, with their steep slopes, favoured the development of an important settlement of the Gepids. In time, they became part of the Hunnic Empire, accumulating many riches. The gold pieces, discovered in 1889, are adorned with precious stones, executed with great precision and a special elegance, found only in the elite class of Rome. Today, the treasure from Șimleu is on display in the Kunsthistorisches Museum in Vienna, proving that the Gepids had connections to Europe's top civilization. (Hajnal Zsuzsanna, 2021).

During the medieval period, the town of Șimleu is known as the residence of the Báthory noble family. The first documentary evidence of the fortress of Șimleu appears in 1351. However, due to the well-being of the area and the wealth of the family, Báthory Miklós, at the end of the 15th century, started the construction of a castle on the right bank of the Crasna River, modernized by new fortifications (Emanoil Pripon, 2017, pp. 19-21). The fortress of Șimleu sheltered the population of the belonging localities during the invasions, ensuring protection for the people in Cehei, Uileac, Giurtelec, Bădăcin and Pericei. Also

here, in the castle courtyard, hunting parties, balls and official meetings were organized, hosting the visits of the captains and the nobility who were passing by or visiting. (Petri Mór, 1906).

Leisure time was the exclusive privilege of the nobility. However, on holidays the peasantry too benefited from this right, in some limited form. During the holidays, serfs could visit holy places, go to religious services, stay with family, or visit their next of kins. The fairs were a great attraction for the world of peasants. Various leisure activities were organized here, fiddlers came, groups were formed that spent time, and at the end of the fair a messenger was paid to be lucky with the new acquisition. The boys and girls came to the fair to get to know each other and to court.

In Jibou, Baron Wesselényi Miklós senior was preoccupied with creating leisure activities, organizing a theater in the castle garden, allowing serfs to take part in the show. At other times, he organized carriage rides for visitors who came to see the family's famous stud farm. Thus, although tourism in Sălaj is not highlighted as a historical economic branch, it still exists as a recreational activity with an evolution from ancient times.

Among the personalities who visited Sălaj at the beginning of the 19th century is the Englishman John Paghet, who refers to his time in Jibou and Hodod, publishing his experiences in his travel diary entitled "Hungary and Transylvania".

The municipality of Zalău, as a historical city of residence, hosted travellers, poets, students, apprentices, politicians, nobles and merchants, who in their free time were preoccupied with spending the leisure time through various activities in the casino, in parks, libraries, churches, inns and the famous fairs where local guild products were capitalized, offering high quality goods and services compared to certain products in the region.

Therefore, through the historical exploration of leisure activities and visits to the lands of Sălaj, it can be seen that tourism in essence has been practiced since ancient times. However, nowadays, these activities are an economic branch, which involves a complex set of professionally performed services.

5. LOCAL ACTIVITIES, TRADITION AND RELIGION IN TERMS OF TOURISM

The development axes of the localities in Sălaj County have focused over time on different branches of the economy such as: agriculture, horticulture, livestock rearing, mineral extractive industry, wood processing, food industry and animal products processing, spa and religious tourism. However, due to

the economic conditions and development policies, the localities of the county have developed disparately compared to the neighbouring counties, generating particular characteristics and unique local versions, which can be transformed into tourist curiosities.

The national stages of industrialization during the communist period, atypically formed the architecture of Romania, considerably reducing the characteristics of local concerns, causing the replacement of crafts with serial work of skilled workers in production segments. Thus, the guilds in Zalău, which were established since the 16th century, dissolved due to the policies of centralized economy, causing at the same time the disappearance of the practice of trades (Elena Muscă, 1988).

The activities of the county museologists managed to save an important part of the objects left from the guilds' activities, thus forming a collection that represents a part of the exhibits in the County Museum of History and Art in Zalău, offering an important tourist attraction to the city.

At the same time, the activity of craftsmen has become unprofitable due to technological changes, lifestyle and modernization. Thus, the trades characteristic of traditional societies can survive only if they are included in the visiting programs of tourists, and the products made are also used as souvenirs. This aspect is achieved through the County Museum of History and Art in Zalău, through the activity of Tourist Information Centres and entrepreneurs.

The workshops and tools used in the crafts characteristic of the localities in the county are mostly preserved in rural areas, due to the survival of the traditions defining the culture of the population, which through an authentic existential way, managed to keep alive the demand for small craftsmen.

The traditional occupation that has turned into an authentic tourist product is that of wine growers, materialized through professional wineries arranged within the KemSilvanum Agrotourism Pension in Camăr, within the homonymous vineyard, the sparkling wine factory of the brand "Silvania" in Şimleu Silvaniei, next to the traditional ones introduced in the tourist circuit of Bocşa commune.

The professional tourist resources are completed by a series of places, people and facts that connect this space with other tourist destinations in the country or abroad, among which we mention:

- related to Şimleu Silvaniei: the King of Poland, Stephanus Bathory (origins and fortress), Iuliu Maniu, political personality from the generation of the Great Union of 1918, Ioan Ossian etc.
- related to the cities of Zalău and Jibou we could mention Baron Wesselényi Miklos jr. who was also a liberal reformer.
- related to Zalău, the poet Ady Endre;
- related to Nuşfalău, the poet Arany János, etc.

Also, at the level of Sălaj County, an impressive number of 66 small wooden churches continue to be preserved (LMI *, 2015), serving exclusively parishioners from rural areas. These wooden churches were built between the 16th and the 19th centuries. The one in Bulgari, Sălăţig commune, built in 1547 (LMI *, 2015), is considered to be the oldest. Their repair and maintenance show the diligence of the folk craftsmen and the religiosity of the community. The value of the small churches in question is part of the ontological heritage of the Transylvanian Romanians, who at their construction formed a community united in the national values formed through the prism of religion.

A visit to the wooden churches in the localities of Sălaj will give the tourist the insight into an ancient space, in which every Romanian was present in the main moments of life, such as: celebration, baptism, marriage and funeral. In this way, the inclusion of the churches in the tourist circuit will also involve saving the cultural, confessional and ethnographic heritage of the Romanians in the researched geographical perimeter.

These are joined by the tourist potential displayed by the stone churches, such as the church of the former Benedictine monastery in Uileacu Şimleului, built between 1260-1300, the synagogue in the city of Şimleu Silvaniei transformed into the Holocaust Museum in Northern Transylvania, but also the monasteries: Bic, Strâmba, Voivodeni, etc.

6. CONCLUSIONS

Sălaj County coagulates the rich history of local communities, through public and private management of specialized resources, in real tourism products suitable for leisure.

The main cohesive contribution of the administration, beyond the maintenance of heritage elements (buildings, vestiges, events, traditions) in the Sălaj tourism sector, lies in capitalizing on the opportunities created by the structural funds of the European Union, the establishment of Tourist Information Centres. They also assume the role of marketer of the administrative-territorial units they represent, building and promoting the image of the tourist destination through marketing products, communication and specialized guidance services. The lack of this contribution, over time, would affect the existence of most cultural resources to support tourism, either through degradation or by abandoning traditions and activities.

BIBLIOGRAPHY

1. Benedek, Rozalia, (2008a), Diffusion of the touristic phenomenon in the North-Western Region, present and perspectives, in Geographica Timisiensis, vol. XVII, nr.1-2, Timişoara, p.239-249
2. Benedek, Rozalia, (2008b), Possibilities for tourism development in the regional microsystem Şimleu Silvaniei, in vol. of the SGR-2007 Conference, with the theme Tourism and sustainable development, Cluj University Press Publishing House, Cluj-Napoca, pp. 243-254
3. Ciangă, N., Dezsi, Ş., (2007), Tourist arrangement, Cluj University Press Publishing House, Cluj-Napoca
4. Hajnal, Zsuzsanna (2021), Gold of the Gepis? Or the treasure from Şimleu Silvaniei closer, URL: https://mnm.hu/hu/cikk/gepidak-aranya-avagy-szilagysomlyoi-kincs-egeszen-kozelrol
5. Muscă, Elena, (1988), Guild boxes from the collection of the County Museum of History and Art, Zalău, in Acta Mvusei Porolissensis, XII, URL: 12-Acta-Mvsei-Porolissensis-XII-1988-Zalau_393.pdf
6. Petri, M., (1906), Szilagyvarmegye monografiaja (Monograph of Sălaj), URL: meek.oszk.hu/04700/04750/html/ 127.html
7. Pop, M., (2018), Personalităţi sălăjene din generaţia Marii Uniri, Editura Argonaut; Mega, Cluj Napoca.
8. Pripon, E., (2017), Museographic achievements and perspectives at Şimleu Silvaniei, Mega Publishing House, Cluj-Napoca.
9. Vedinaş, T. (coord.) (2018), Sălajul la centenar, Edit. Caiete Silvane, Zalău.
10. *** (2015), Order of the Minister of Culture no. 2828, List of historical monuments (LMI *) - Sălaj County, Published in the Official Gazette of Romania, Part I., no. 113 bis.
11. ***, (2008), Lisbon Treaty consolidated version, Brussels, http://www.fsenordest.ro/Download/doc_prog/TratatuldelaLisabona.pdf.
12. ***, (2008), Green Paper on Territorial Cohesion, The Way Forward, in Inforegio Panorama, no. 28, https://ec.europa.eu/regional_policy/sources/docgener/panorama/ pdf / mag 28 / mag28_ro.pdf.
13. ***, Zalău National Center for Tourist Information and Promotion (Zalău National Center for Tourist Information and Promotion), URL: www.turismzalau.ro.
14. ***, Şimleu Silvaniei National Center for Tourist Information and Promotion (National Center for Tourist Information and Promotion Şimleu Silvaniei), URL: https://cniptsimleu.ro/.

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SCIENTIFIC LIFE:

4TH INTERNATIONAL CONFERENCE ON CANADIAN, CHINESE AND AFRICAN SUSTAINABLE URBANIZATION (ICCCASU4) VIRTUAL CONFERENCE MONTREAL, CANADA, 28 - 31 JULY 2021

GABRIEL CAMARĂ[1]

With a focus on urban world from regions which account more than 2,7 billion of the world population, The International Conference on Canadian, Chinese and African Sustainable Urbanization (ICCCASU) is an important international think-tank which promotes "sustainable and inclusive urban development in a forum based on the diverse but complementary experiences of Canada, China, and African nations" (ICCCASU, 2021). ICCCASU take place every two years and rotates between the three regions, since its inception in 2015. Originally it was a collaboration between UN-Habitat and the University of Ottawa; then ICCCASU has expanded to a consortium of three Canadian universities (Carleton University, McGill University, and University of Ottawa) and Chinese and African universities.

The 2121 conference (ICCCASU4), with more than 200 participants from 39 countries, was organized virtually by David Covo, McGill University, and Tonton Mundele, Global Affairs Canada, under the theme of "Density, Diversity, and Mobility: The City in an Era of Cascading Risks".

The opening ceremony was co-hosted by Mr. Claude Ngomsi, Senior Programme Management Officer at UN-Habitat (Kenya), and ICCCASU's Chair of Latin America & Caribbean Relations, Ms. Luisa Gomez. The speeches were delivered by Canadian politicians and academics, such as Professor Huhua Cao, University of Ottawa & Co-President of ICCCASU, and international guests, such as Ms. Maimunah Mohd Sharif, Executive Director of UN-Habitat.

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The keynote session following the opening ceremony was co-hosted by Professor Benjamin Gianni, Carleton University, Mr. Allan Cain, Development Workshop (Angola), and Mr. Rong Yang, UN-Habitat. Keynote speeches were delivered by David Miller, Director of International Diplomacy, C40 Cities Climate Leadership Group & Former Mayor of Toronto, Leilani Farha, Global Director of NGO the Shift & Former UN Special Rapporteur on the Right to Housing, and Oumar Sylla, Director of UN-Habitat Regional Office for Africa.

The second day of the conference hosted two dialogue sessions. First one was co-hosted by Professor David Covo, McGill University, and Professor Denise Piché, Université Laval, and was based on the theme of the Post-Pandemic City. The presenters were Mary Rowe, President & CEO of Canadian Urban Institute, Vikram Bhatt, Professor Emeritus, Peter Guo-hua Fu School of Architecture (McGill University), René Joly Assako Assako, Vice-Recteur, Université de Douala, and John Zacharias, Peking University. The second dialogue session was co-hosted by Mr. Allan Cain, Development Workshop (Angola), and Professor Benjamin Gianni, Carleton University, and was based on the theme of affordable housing. The presentations were made by Kecia Rust, Executive Director of the Centre for Affordable Housing Finance in Africa, Patricia Roset-Zuppa, Vice-President Policy of Canada Mortgage and Housing Corporation, Anacláudia Rossbach, Regional Manager for the Latin America and Caribbean Cities Alliance, and Zhi Liu, Director of China program, Lincoln Institute of Land Policy, Peking University.

The second keynote session took place in the third day of the conference, and it was co-hosted by Professor Benjamin Gianni, Carleton University, and Professor Olivier Dehoorne, Université des Antilles. The keynote speeches on affordable housing, sustainable policy development in the Caribbean, and Chinese infrastructure development were delivered by Mario Polèse, Professor emeritus at Institut national de la recherche scientifique, Mimi Sheller, Inaugural Dean of the Global School (Worcester Polytechnic Institute), and Zhi Liu, Director of China program, Lincoln Institute of Land Policy, Peking University.

The main activities of the Conference were the presentations included in six thematic areas for the panel discussions, which took place on days two to four:

1. Towards More Resilient Cities Worldwide, coordinated by John Zacharias, Peking University, and Inês Macamo Raimundo, Eduardo Mondlane University.

This thematic area had six panel discussions:

- Metropolisation and Urban Renewal, hosted by Antoine Beaulieu, Université Laval, and Yombi Ouedraogo, UN-Habitat;

- Displacement and Rural-Urban Development, hosted by Liping Yue, Northwest University, and George Onatu, University of Johannesburg;
- Urban Resilience: from Theory to Practice, hosted by Bing Xue, Technische Universität Berlin, and Aly Sada Timera, Université Cheikh Anta Diop de Dakar;
- Resilience and Sustainable Infrastructure, hosted by John Zacharias, Peking University, and Stephanie Loose, UN-Habitat Burkina Faso;
- Urban Resilience and Coastal Development, hosted by Amy Huangqing Li, Associated research Centers for Urban Underground Space, and Andrea Brown, Wilfrid Laurier University.
- Education for Resilient Cities, hosted by Vincent Kitio, UN-Habitat Kenya, and Laïla Amraoui, Université IBN Zohr.

2. Preparedness and management of COVID 19 and climate change in cities, coordinated by Yangfan Li, Xiamen University, and Tonton Mundele, Global Affairs Canada.

This thematic area had three panel discussions:

- Covid-19 Breakout and Cities Preparedness, hosted by Yangfan Li, Xiamen University, and Lolita Shaila Safaee Chalkasra, University of Ottawa;
- Covid-19 and Climate Change, hosted by Tonton Mundele, Global Affairs Canada, and Douglas Mure-Ravaud Raga, UN-Habitat;
- Covid-19 Breakout and Risk Assessment, hosted by Abimbola Omolabi, Yaba College of Technology, and Dewei Yang, Southwest University.

3. Forecasting and Forward-Looking Urban Risks Management: Managing Increasing Density, Diversity, and Mobility, coordinated by David Covo, McGill University, and Dingping Guo, Fudan University.

This thematic area had four panel discussions:

- Building Inclusive and Sustainable Cities, hosted by Philippe Régnier, Université d'Ottawa, and Dingping Guo, Fudan University;
- Urban Complexity and Urban Development, hosted by David Covo, McGill University, and Jerzy Bański, Polish Academy of Science;
- Environment Comfort and Urban Space, hosted by Wang Hong, Shanghai University, and Adiaratou Thiam, Ministère des Affaires foncières de l'Urbanisme et de l'Habitat Mali ;
- Cities facing Diverse Challenges was hosted by Fachun Du, Yunnan Agricultural University, and Kamyar Razavi, Simon Fraser University.

4. Privacy, Surveillance, Security, Governance and Collective Wellbeing, coordinated by Claude Ngomsi, UN-Habitat, and Yuenan Li, University of Ottawa.

This thematic area had two panel discussions:

- Politics and Urban development, also hosted by Claude Ngomsi, UN-Habitat, and Yuenan Li, University of Ottawa;
- Theoretical and empirical analysis of Urban development, hosted by Abdelhamid Benhmade, University of Ottawa, and Asia Lachir, National School of Architecture.

5. Health Crises in Cities: Learning from the Past and Planning for the Future, coordinated by Ian Cooper, Employment and Social Development Canada, and Haotian Guan, University of Ottawa.

This thematic area had three panel discussions:

- Urban Health in the Era of Covid-19, hosted by Ian Cooper, Employment and Social Development Canada, and Antara Tandon, UN-Habitat India;
- Urban Development in the Post-Covid Eras, hosted by Ruibo Han, University of Maryland, and Emmanuel Takang, University of Yaounde I;
- Health Issue and Urban Pattern, hosted by Ines Raimundo, Eduardo Mondlane University, abd Abdinassir Sagar, UN-Habitat Kenya.

6. Housing: Access, Affordability and Informality, coordinated by Benjamin Gianni, Carleton University, and Allan Cain, Development Workshop Angola.

This thematic area had three panel discussions:

- Affordability Housing and Informal Settlement, hosted by Benjamin Gianni, Carleton University, and Atik Mohamed, Université Ibn Zohr;
- Urban Governance and Housing Cost, hosted by Matti Siemiatycki, University of Toronto, and Claude Ngomsi, UN-Habitat Kenya;
- Public Policy and Homelessness, hosted by Allan Cain, Development Workshop Angola, and Benoît Mougoue, Université de Yaoundé 1.

The Conference also had five special panels:

- Human Mobility and Tourism in the Caribbean in the Context of the Socioeconomic Impact of Covid-19: How are Governments Coping? consisted of four panel sessions: Cruise Tourism: Interests and Limits of a Model; Impacts of COVID-19 in Caribbean's Islands: Lessons and

Perspective; Haiti's Dilemma, from One Crisis to Another; The Impact of COVID-19 on Tourism and Mobilities: Comparative Regional Approaches.

- Built-environment in the Post Pandemic Era - Revisiting the Planning Doctrines consisted of two sessions: Community-Based Initiative and Transformational Planning; Planning, Mobility, Built Environment and Real Estate Development.
- Results-Based Local Governance, and Regional Green Economic Growth.
- Industrial Parks, Agro-processing Zones and Urban Transformation had three panels: China-Africa industrialization, urbanization and planning experience and cooperative research; Development and planning of China's overseas industrial parks along the Belt and Road initiative; China and Africa industrial park development experience.
- Are Latin American Cities Inclusive for Migrants? consisted of the sessions: Inclusive Cities in Latin American; Urbanity and Governance in Brazil.

On the third day of the conference, a special event was held: "Impact of the Urban Environment on Health and Wellbeing". It was chaired by Pamela Carbajal, UN-Habitat Kenya, who also presented an academic speech, followed by Zhou Ying, Planner, Wuhan Land Use and Urban Spatial Planning Research Center, and Kristie Daniel, Director of the Livable Cities program & Head of local office in Ottawa, Health bridge.

A round table chaired by Patricia Zander, Université de Strasbourg, took place on the fourth day of the conference. Its theme was "Towards otherwise resilient cities?", and the presentations and discussions were made by Geraldine Djament, Université de Strasbourg, Kamala Marius, Université de Bordeaux, and also Patricia Zander.

The full programme and the videos of the speeches from the Conference are available on the Conference's website. The next Conference (ICCCASU5) will be held in 2023.

REFERENCES

ICCCASU, 2021. *International Conference on Canadian, Chinese and African Sustainable Urbanization (ICCCASU).* [Online] Available at: https://icccasu2021.org/[Accessed 20 08 2021].