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## Foreword

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The published articles focus on IT&C and belong to national and international researchers, professors who want to share their results of research, to share ideas, to speak about their expertise and Ph.D. students who want to improve their knowledge, to present their emerging doctoral research.

Being a challenging and a favorable medium for scientific discussions, all the issues of the journal contain articles dealing with current issues from *computer science, economics, management, IT&C, etc.* Furthermore, JISOM encourages the cross-disciplinary research of national and international researchers and welcomes the contributions which give a special “touch and flavor” to the mentioned fields. Each article undergoes a double-blind review from an internationally and nationally recognized pool of reviewers.

JISOM thanks all the authors who contributed to this journal by submitting their work to be published, and also thanks to all reviewers who helped and spared their valuable time in reviewing and evaluating the manuscripts.

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## SEASONAL CONCENTRATION OF TOURISM IN CROATIA

Goran Ćorluka<sup>1\*</sup>  
Ana Vukušić<sup>2</sup>

### ABSTRACT

*The majority of Mediterranean countries is suffering from seasonality. The seasonal pattern is most expressed in destinations famous for leisure tourism. Croatia is one established example of sun-and-sea destinations. Tourist activities are increasing, whereby tourism is growing but not developing, resulting with seasonality of business. The paper makes evaluations based on secondary data acquired from statistical publications of The Croatian Ministry of Tourism. Using methodological approaches: Seasonality ration, Lorenz curve and Gini coefficient seasonal concentration is measured. Extreme seasonal concentration in tourist arrivals and overnights is identified. Economical, employment, ecological and socio-cultural implications arising from tourism seasonality are elaborated and proposals for future activities to mitigate seasonal concentration of tourism are provided. The paper contributes to the seasonality literature by applying different measurement methods in a holist way and by detailed elaboration of implications arising from seasonal concentration of tourist activities.*

**KEYWORDS:** *Seasonal concentration, tourism, Croatia, seasonality implications*

### INTRODUCTION

Tourism is one of the leading and fastest growing industries in the world (Volvo, 2010). The importance of tourism in the world economy is highlighted in the World Travel & Tourism Council report (WTTC 2017). According to the annual research in 2016 total contribution of Travel and Tourism to GDP was 10.2% of total GDP, the total contribution of Travel and Tourism to employment was 9,6%, visitor exports generated USD1,401.5bn (6,6% of total exports), while the contribution of Travel and tourism to total investment was 4,4%. Tourism is seen as an economic generator, especially in less-developed countries. Economies are looking for an economic breakthrough through tourism. The main achievement is the increase in tourist arrivals and overnights, whereby the tourism industry is growing under uncontrolled conditions. Nowadays we have examples of countries experiencing a rapid growth of tourist activities and dominantly relying on tourism as economic activity, experiencing growth rather than development. Strategic planning is missing and the focus is on tourism expansion instead on tourism development. The unconstrained increase in tourist activities is resulting with spatial and

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temporal overuse of tourist facilities. Destinations end up suffering from overutilization in one part of the year and underutilization in the rest of year. Synonymous for such tourism development is given in many destinations on the Mediterranean, one example is Croatia. Croatia is a well-established tourist destination on the Mediterranean famous for beach tourism. The last two decades tourism became Croatian leading industry. With the intention to highlight the increase of tourist activities on the territory of Croatia the comparison of tourist arrivals 2016 to 2005 and 1995 is provided. Number of tourist arrivals in 2016 was 15.594,157 comparing to 9.995,000 in 2005 and 2.438,000 in 1995, which is an increase of 56% to 2005 539,65% to 1995 (Ministry of Tourism, Republic of Croatia, 2015). In the new decade average increase in the annual rate of change in arrivals is 6,66% and 5,59% in overnights (Ministry of Tourism, Republic of Croatia, 2010-2016), tourism revenues are also increasing with an average annual rate of change in the observed period of 4,79% (Croatian National bank, HNB 2010-2016). Without doubt Croatia is expanding in tourism. Tourism is continuously gaining on importance in the overall national economic situation. Tourism is a great contributor to the GDP (share of 18,2%), exports (share of 35,1% of visitor exports in total exports), employment (direct tourism employment share of 6,6% in total employment) and investment (0,92% share of investments in tourism sector in GDP (Croatian National bank, HNB 2015). The growth of Croatian tourism is extensive and uncontrolled, with an increased dependence of the national economy on tourism. Multiplying tourism effects is the set goal, but sustainability is missing. Today Croatian tourism is internationally established as a sun-and-sea destination. Tourist activities are concentrated on the coastline within the seven coastal counties during the summer months.

Table 1. Coastal counties share in total tourist arrivals

Year	2010	2011	2012	2013	2014	2015	2016
<b>Share of coastal arrivals in total arrivals (%)</b>	88,74	88,85	88,66	87,90	87,54	87,21	87,12

*Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.- 2016., Ministry of Tourism, Republic of Croatia*

Table 2. Coastal counties share in total tourist overnights

Year	2010	2011	2012	2013	2014	2015	2016
<b>Share of coastal arrivals in total overnights (%)</b>	96,07	96,12	96,11	95,79	95,57	95,38	95,25

*Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.- 2016., Ministry of Tourism, Republic of Croatia*

According to Table 1 Croatia is facing a high degree of spatial concentration in tourist arrivals as the share in total arrivals is up to 88,74% in the observed period. Despite the slight decrease from 88,74% in 2010 to 87,12% the concentration is alarming. The spatial concentration in tourist arrivals is outperformed in overnights reaching 96,12% in the observed period. The share of 95,25% tourist overnights in the coastal area in 2016 is supporting the perception of Croatia as a summer sun and beach tourist destination. Croatia is beside the spatial concentration facing temporal concentration presented in the

remainder of the paper. The aim of this paper is to, by comparing methodological approaches, identify the degree of seasonal concentration in Croatian tourism and to highlight main implications deriving from extreme temporal concentration of tourism.

## **METHODOLOGY**

Data on arrivals and overnights, for the observed period of six years 2010-2016, was obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.- 2016., Ministry of Tourism, Republic of Croatia. In order to calculate seasonal concentration in tourist arrivals and overnights a combination of measurement methods including Seasonality ratio, Lorenz curve and Gini coefficient were applied to measure the degree of seasonality and compare the degree of seasonality between years. The Seasonality ratio is calculated by taking the highest number of visitors and dividing these by the average number visitors (Yacoumis, 1980). The Seasonality ratio is increasing with the increase of the degree of seasonal concentration, ranging from 1 to 12. If the number of visitors is constant over the year, 12 months, the Seasonality ratio will be 1, in case the number of visitors is concentrated in one month, the Seasonality ratio will be 12. The Lorenz curve is a graphical illustration of inequality. The Lorenz curve, line of inequality, is calculated by dividing the monthly numbers of tourist arrivals/overnights with the total number of tourist arrivals/overnights within a given year, hence the monthly ratios have been calculated. Further, the monthly ratios have been ranked from low value to high value and cumulative values of ratios of calculated. The gap between the Lorenz curve and the line of equality is the inequality gap. A higher slope points out higher seasonal concentration. The Gini coefficient is the most commonly used measure of inequality representing the area between the Lorenz curve and the line of equality (Lundtrop, 2001). The Gini coefficient is ranging from 0 to 1, whereby 0 indicates perfect equality and the value of 1 indicates full unequal distribution of tourist arrivals by months (Kalamustafa and Ulma, 2010). The formula used in the calculation of the Gini coefficient is explained by Lundtrop (2001)  $G = \frac{2}{n} \sum_{i=1}^n (x_i - y_i)$   $n$  = ratio value,  $x_i$  = ratio order,  $y_i$  = cumulative actual ratios in the Lorenz curve. With the increase of Gini coefficient increases the level of seasonal concentration.

## **RESULTS**

Analysis of seasonal concentration in Croatian tourism started with the application of Seasonality ratio on collected data (Table 3).



Table 3. Seasonality ratio 2010.-2016.

		2010		2011		2012		2013		2014		2015		2016	
		total		total		total		total		total		total		total	
		arrivals	nights	arrivals	nights	arrivals	nights	arrivals	nights	arrivals	nights	arrivals	nights	arrivals	nights
1	January	107108	303264	108444	275138	119765	310462	107754	277420	124105	311790	143193	362383	155197	394353
2	February	125783	292959	131720	294759	117325	284543	135206	311455	143180	319693	164234	368780	193690	425593
3	March	212840	542570	202780	466786	232981	560273	261242	681147	241823	555711	287506	677798	346753	847986
4	April	470355	1324473	573754	1656647	575333	1632032	548736	1465288	642150	1737616	662418	1749515	653634	1676660
5	May	847641	2979672	792199	2615880	923520	3247770	1037489	3819611	1039816	3319560	1193491	3980684	1218276	4270234
6	June	1325814	6425037	1597348	7794268	1594451	7597318	1667168	7726889	1832442	8708442	1907030	8742000	1909354	8960910
7	July	2747894	17353975	2889885	17810473	2882654	18456016	2915868	18791963	2945798	18401984	3328448	20373298	3914067	22852480
8	August	2856101	19002424	2990657	20233298	3051943	20696087	3346678	21376907	3613735	22499225	3868922	23732640	3985686	25473938
9	September	1122874	6059794	1319949	6852477	1452988	7464083	1454024	7683276	1467872	7840157	1640773	8669315	1878168	9666033
10	October	453963	1372735	501834	1547446	536148	1681016	588361	1798675	658857	1876270	677904	1963488	767087	2275386
11	November	185816	429971	191491	456282	195203	464047	208946	508077	224472	488482	240194	511624	286228	612032
12	December	147927	329505	155616	350821	152849	349816	170004	387106	194166	425018	229210	473790	286017	594247
	Average	883676,3	4701365	954639,8	5029523	986263,3	5228622	1036790	5402318	1094035	5540329	1195277	5967110	1299513	6504154
	Seasonality ratio	3,232067	4,041895	3,13276	4,022906	3,09445	3,95823	3,227924	3,956988	3,303127	4,060991	3,236842	3,977242	3,067061	3,916564
	Aug/Jan	26,66562	62,65968	27,57789	73,53873	25,48276	66,66222	31,0585	77,05611	29,11837	72,16147	27,01893	65,49049	25,68146	64,59679

*Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.- 2016., Ministry of Tourism, Republic of Croatia*

According to the calculated Seasonality ratio Croatia is experiencing extreme seasonal concentration of tourist arrivals and overnights. The ratio indicates a higher concentration in tourist overnights than tourist arrivals, which is attributed to the longer period of stay in high season per arrival and correspondingly a higher share of August overnights compared to August arrivals. The Seasonality ratio is emphasizing an uneven distribution in tourist activities as can be seen in 2016 August had 3,07 times more arrivals than the annual average and 3,92 times more overnights than the annual average. The unevenly distribution of tourist activities is presented by the August/January ration. Comparing the month with the highest tourist arrivals/overnights, August, and the lowest tourist arrivals/overnights, January, enormous uneven proportions are identified. August achieved 25,68 times more arrivals than January and 64,59 times more overnights than January. Within the observed period, despite some slight changes, the seasonal ratio is constant in arrivals and overnights (Figure 1).

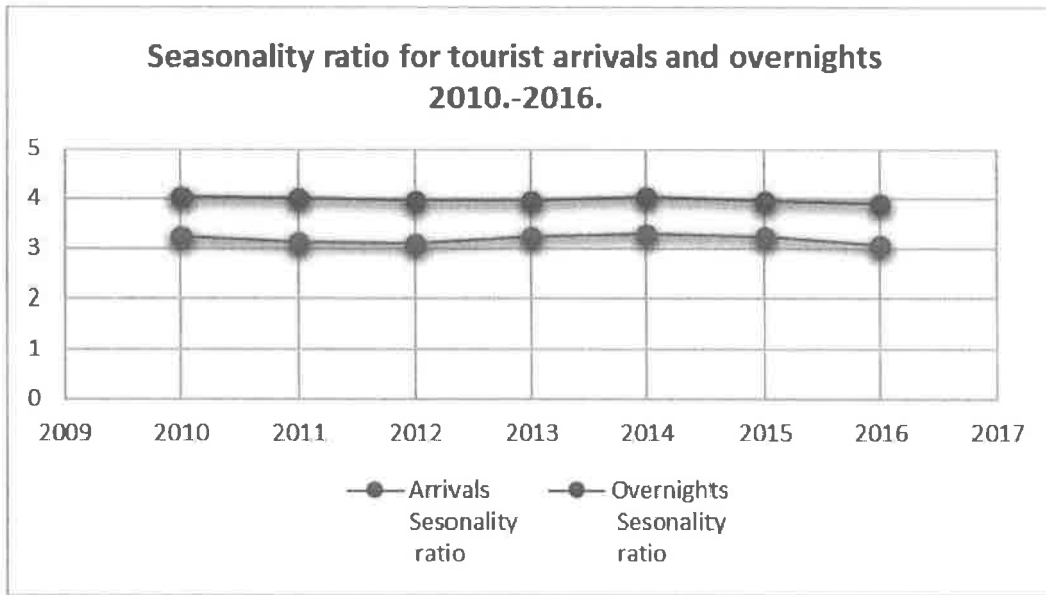


Figure 1. Diagram of seasonality ratio for tourist arrivals and overnights 2010.-2016.  
 Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.- 2016., Ministry of Tourism, Republic of Croatia

The analysis continued with the calculation of the Lorenz curve. The Lorenz curve (Figure 2) shows the distribution of tourist arrivals against the months of year. The unequal distribution of tourist arrivals has yielded the curve. The share of tourist arrivals in the best performing quarter of year outstrips arrivals in the rest of year. Due to the intense concentration of tourist arrivals in the top performing months of year the gap between the line of equality and the Loren curve is high, pointing out uneven distribution and seasonal concentration. The Lorenz curve for tourist overnights (Figure 3) is more yield, compering to tourist arrivals, indicating an even higher concentration over tourist overnights in the high tourist season. The shape of Lorenz curve within the observed period is consisted, pointing out stability of seasonal concentration of tourist activities.

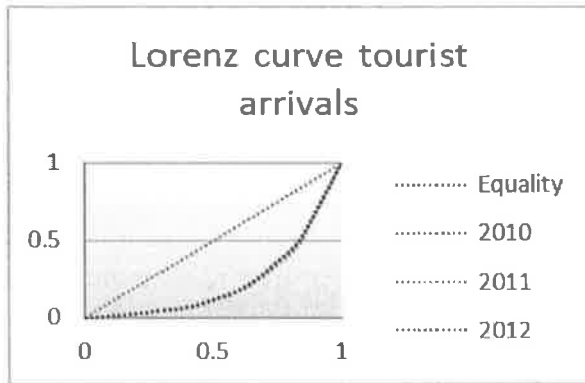


Figure 2. Lorenz curve for tourist arrivals 2010.-2016.

Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.-2016., Ministry of Tourism, Republic of Croatia

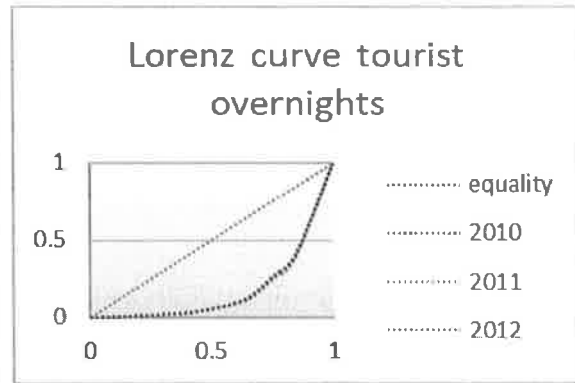


Figure 3. Lorenz curve for tourist overnights 2010.-2016.

Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.-2016., Ministry of Tourism, Republic of Croatia

The last applied measurement method is the Gini coefficient. As a support to the Lorenz curve, Gini coefficient is using Lorenz curve data to present the inequality of tourist activities. As given in Figure 4 Gini coefficient for tourist arrivals in the observed period is very high reaching a maximum of 0,68 in 2011, average value during observed period is 0,55. Since the maximum value of Gini coefficient is 1 it can be stated that extreme seasonal concentration is experienced. Tourist overnights have the same intense and are even higher in value compared to arrivals, average value during observed period is 0,64. As did the previous measurement methods also does the Gini coefficient indicate constancy over years.

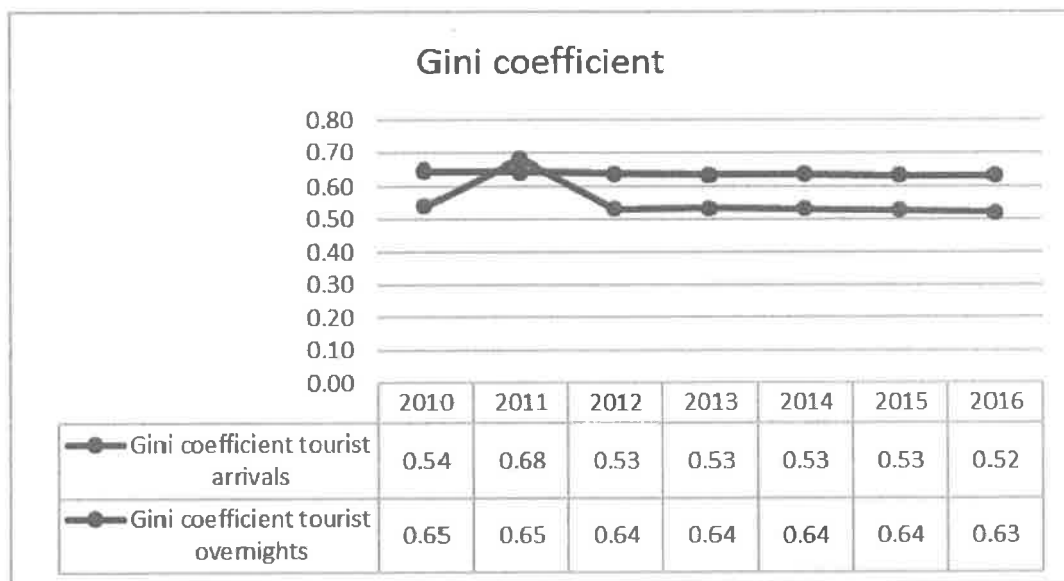


Figure 4. Gini coefficient of tourist arrivals and overnights

Source: Author's calculations based on data obtained from Croatian Bureau of statistics (CBS) and "Tourism in figures", Editions 2010.-2016., Ministry of Tourism, Republic of Croatia

Used methodological approaches identified extreme seasonal concentration in tourist arrivals and overnights. The Seasonality ratio points out a disproportionate proportion of tourist arrivals and overnights in the best performing month, August, and the annual average, showing high concentration of tourist activities in one month of year. The Lorenz curve together with the Gini coefficient demonstrate the uneven distribution of tourist arrivals and overnights within the year, showing intensive concentration of tourist activities during the main tourist season with a great share in overall annual tourist activities.

## **IMPLICATIONS OF SEASONAL CONCENTRATION**

Implications of seasonal concentration are resulting due to the overuse of capacities and resources in one part of the year, and underuse of capacities and resources in the other part of year. Literature is classifying implications arising from tourism in four major categories: economical, employment, ecological and socio-cultural implications. Economical and employment implications arise from underutilization in off season, while ecological and socio-cultural arise from overutilization in the high season.

The economic implications are mainly related to the off-season period (McEniff, 1992). Economic implications occur due to excessive use of resources in the high season and underuse of resources in low season (Butler, 1994). The problem of seasonal business operation is particularly pronounced in the tourism industry because tourism product bears the characteristics of intangibility and impermanence, so products do not have the possibility of storing or redistribution, which means if the product or service is not sold on the day its value is zero (Cooper et al, 2005; Goeldner and Ritchie, 2003; Commons and Page, 2001). In the accommodation sector, the negative implications of seasonal fluctuations in demand are leading to a lack of accommodation in the high season, while underuse of accommodation facilities in the off-season period can have disastrous economic effects (Koenig and Bischoff, 2005). Seasonality causes loss of profits due to the inefficient use of resources and the constant fear of insufficient use of capacities (Butler, 1994; Sutcliffe and Sinclair 1980). Companies and society should achieve a sufficient level of income in a few hectic weeks of summer in order to ensure coverage of annual fixed costs and success for the full year (Goulding, Baum and Morrison, 2004). From the aforesaid arise low return on capital invested what is the main obstacle to the entry of new capital from private investors and lenders in the tourist sector (Cooper et al., 2005; Goulding, Bauman and Morrison, 2004; Commons and Page, 2001; Butler, 1994). Acute seasonal concentration of tourism in Croatia is one of the causes for not having branded international investment in tourism sector. Furthermore, excessive utilization is resulting with price increase during the tourist peaks (Cellini and Rizzo, 2010; Commons and Page, 2001). In an effort to emphasizing the existence of positive economic implications of seasonality name maintenance on buildings or sites, that are usually scheduled for off-season, supporting the construction and related economic activities, can be named.

The phenomenon of seasonality in the tourist industry has a dramatic impact on employment, causing high employment in peak season and reduced employment in off-season. Seasonal employment affects the economy, employees and local communities, and therefore is separately considered from the other impacts of seasonality. Seasonality and employment in the tourism industry is a well-researched topic in the academic

literature, but there is still a general lack of theoretical knowledge (Krakover, 2000). The biggest problem of seasonal employment occurs in the full time recruitment and retention of employees in destinations marked with seasonality of business (Yacoumis, 1980). Instability of employment conditioned by seasonal demand for labor caused a significant decline in the rate of employees in the off-season period, where the workforce is forced to leave the tourist destination in search of permanent employment, which has negative economic impacts on the destination (Szívás et al. 2003). The workplace in tourism is usually considered as temporary jobs with low wages and unpopular working hours, wherein seasonality makes this kind of work more unstable, so employees are exhausted in the high season and they are forced to seek alternative sources of income in off season (Kolomiets, 2010). Murphy (1985) points out that the ratio of staff and skills are minimal, since less training is provided for the temporary employees. Therefore, it is particularly difficult to maintain the standards and quality (Baum, 1999). Seasonal work is usually seen as "less significant" and tends to attract less educated, semi-skilled or unskilled staff. Seasonality in employment is not always necessarily negative, positive effects are seen in the employment of students and housewives who are able to be employed only during certain periods of the year (Koenig and Bischoff, 2005). Seasonal tourism companies are faced with a number of challenges, contrary to companies that operate continuously throughout the year, as they require productive and trained staff but also seasonal and temporary employed. Recruitment and hiring an adequate number of seasonal employees cause financial cost on training and is a challenge for the human resources department (Cooper et al. 2005). What makes this issue even more challenging is that such companies must maintain effective and professional staff and at the same time rely on those less experienced and less skilled workers. Seasonal workers have less time to adapt to the working environment but still have to give their best in the peak season. What would be desirable for these companies is to try to restore the same, already trained workers year after year and thus reduce training costs, increase the quality of services and thus increase the usefulness and satisfaction of the consumer. Croatian tourism is over the last few years facing enormous problems regarding seasonal employment. Despite government activities the problem couldn't be overcome and even escalated even more. This challenge is going to increasingly affect the tourism economy in Croatia. On the other hand, workers benefit because they return to the same job, season after season, and are already familiar with the environment and the workplace and therefore stress is minimized. Consequently, the return of seasonal workers in the same workplace is mutually beneficial for both the employee and the employer (Kolomiets, 2010).

Hartmann (1986) highlights that it would be wrong to evaluate tourism seasonality only in economic conditions, and to separate the regional tourism services system from their social environment and ecological base. Environmental implications are largely synonymous with the negative effects arising through the concentration of visitors during the peak season in the tourist destination. This includes, for example, congestion of rural areas, disruption of wildlife, waste water production, noise, pollution, depletion of natural resources, etc. (Chung, 2009; Bender, Schumacher and Stein, 2005). Manning and Powers (1984) highlights the vulnerability of the ecological carrying capacity of the excessive concentration of tourist demand in the area. Articulate pressure on the often fragile environment, caused by overcrowding and over-utilization during the summer, is cited as the main problem of environmental protection (Butler, 1994), and as one of the causes of

unsustainable tourism development. Although in long term raises the belief that seasonality is positive for the environment, according exclusively high use during the season, and not scattered all year round use of natural resources, providing rest and time for renewal during the off-season period (Higham and Hinch, 2002; Butler, 1994; Hartmann, 1986), but under question is the degree of overuse during the peak season period as it might cause damages which are not renewable. High-rise seasonal concentration is endangering protected areas in Croatia. Natural carrying capacity level is on topic, having set limitations of daily visitors in protected areas, as it is the case in National Park Krka Waterfalls.

Socio-cultural implications of seasonal variations do not only reflect on the local community but also on the visitors (Koenig and Bischoff, 2005). Studies dealing with this issue put the focus on the local community. The negative socio-cultural impacts on local community are crowds on the streets, traffic jams and lack of parking spaces, increasing population during the summer, waiting for various services, growth in prices of social services, increasing crime, overloaded infrastructure and so on (Chung, 2009 ; Bischoff and Koenig, 2005; Allcock, 1989; Murphy, 1985). Manning and Powers (1984) highlight the vulnerability of the social carrying capacity due to the excessive concentration of tourist demand in the area. The positive socio-cultural impact of tourism seasonality is the ability of local community, during the off-season, to fully enjoy their environment, and to have the ability to relax from the stress and strain and to revitalize and renew (Higham and Hinch, 2002; Butler, 1994; Hartmann, 1986; Murphy, 1985). The high concentration of tourist activity during peak tourist season has also negative implications on the tourist demand, which has been neglected by researchers. The satisfaction of tourists may be reduced due to overcrowded tourist attractions, the lack of tourist facilities, insufficient quality of services, payment of high prices in the peak season, conversely in the off-season period numerous facilities are out of order (Young, 2004; Commons Page 2001; Krakover, 2000; Butler, 1994). Croatia is planning, regarding the socio-cultural carrying capacity to apply limitation of number of daily visitors in protected cultural heritage centres, for example Dubrovnik.

## **DISSCUSION AND CONCLUSION**

Most tourist destinations experience seasonal patterns of tourist visitation (Jang 2004). Spatial and temporal concentration in tourist activities is not a particular characteristic of a single destination or country, it is experienced in almost all destinations and countries in the world. Croatia, as a Mediterranean destination, attracting mostly motivated by leisure sun and sea tourism is experiencing pronounced seasonal concentration of tourist activities. As presented, seasonal concentration of tourism in Croatia is extreme high. Croatia is seen as one of the world's most seasonal affected destinations, having in 2016 August 3,07 times more arrivals than the annual average and 3,92 times more overnights than the annual average, with a Gini coefficient of 0,52 for tourist arrivals and 0,63 for tourist overnights. As a result of enormous seasonal concentration implications affecting the economy, employment, ecology and socio-cultural community are arising. Croatia is suffering from tourism seasonality and seeking for solutions to combat or mitigate the seasonal pattern of tourism. Croatian tourism will be challenged to expand the high season, attract visitor in the off season and to make tourism more sustainable. Activities

which have to be undertaken include promotion of diversity of Croatian as a tourist destination, proactive destination management, adaptation of tourist supply to demand needs in off season period, increasing accessibility of destinations. Croatia has to turn to new market segments and diversify the destination product. Despite the activities provided by the Ministry of tourism and the Croatian national tourist board, results are missing. The public and private sector have to be involved to alleviate the implications arising from emerging to seasonal concentration and to manage to, at least, extend the season, as higher goal might be to unrealistic at the moment.

## **LITERATURE**

- [1] Allcock, J. B. (1989), Seasonality, In Witt, S. F. and Moutinho, L. (eds), *Tourism Marketing and Management Handbook*, London, Prentice Hall, str.387-392.
- [2] Baum, T., (1999), Seasonality in tourism: understanding the challenges, *Tourism Economics*, Vol. 5 (1), 5-8.
- [3] Bender, O., Schumacher, K. P., Stein, D. (2005), Measuring Seasonality in Central Europe's Tourism – how and for what, *CORP & Geomultimedia*05, Feb. 22-25, str. 303-309.
- [4] Butler, R., (1994), Seasonality in Tourism: Issues and Problems, In: Seaton, A.V. (ed), *Tourism: The state of Art*, p. 332-339.
- [5] Cellini, R., Rizzo, G., (2010), Private and Public Incentive to Reduce Seasonality: a Simple Theoretical Model, University of Catania, Faculty of Economics & DEMQ, Catania, doi: <http://dx.doi.org/10.5018/economics-ejournal.ja.2012-43>
- [6] Chung, J. Y., (2009), Seasonality in Tourism: A Review, *e-Review of Tourism Research (eRTR)*, Vol. 7, No. 5, str. 82-96.
- [7] Commons, J., Page, S., (2001), Managing Seasonality in Peripheral Tourism Regions: The Case of Northland, New Zealand, u Baum T., Lundtrop, S., *Seasonality in tourism*, Pergamon, Amsterdam, str. 153-172. doi: <http://dx.doi.org/10.1016/B978-0-08-043674-6.50013-1>
- [8] Cooper, C., Flechter, J., Fyall, A., Gilbert, D., Wanhill, S., (2005), *Tourism Principles and Practice*, (3re ed.), Pearson Education
- [9] Croatian National bank, (2015), *HNB Statistic report*
- [10] Goeldner, C. R., Ritchie, J. R. B., (2003), *Tourism: Principles, Practice, Philosophies*, (9th ed.), New York, Chichester: Wiley
- [11] Goulding, P. J., Baum, T. G., Morrison, A. J., (2004), Seasonal Trading and Lifestyle Motivation: Experience of Small Tourism Business in Scotland, *Journal of Quality Assurance in Hospitality and Tourism*, Vol. 5 (2/3/4), str. 209-238. doi: [http://dx.doi.org/10.1300/J162v05n02\\_11](http://dx.doi.org/10.1300/J162v05n02_11)
- [12] Hartmann, R., (1986), Tourism, seasonality and social change, *Leisure Studies*, Vol. 5, No. 1, str. 25-33.

- [13] Higham, J., Hinch, T., (2002), Tourism, sport and season: the challenges and potential for overcoming seasonality in the sport and tourism sector, *Tourism Management*, Vol. 23, str. 175-185. doi: [http://dx.doi.org/10.1016/S0261-5177\(01\)00046-2](http://dx.doi.org/10.1016/S0261-5177(01)00046-2)
- [14] Karamustafa, K., Ulama, S., (2010), Measuring the seasonality in tourism with the comparison of different methods, *EuroMed Journal of Business*, Vol. 5, No. 2, 191-214. doi: <http://dx.doi.org/10.1108/14502191011065509>
- [15] Koenig, N., Bischoff, E. E. (2004), "Analyzing Seasonality in Welsh Room Occupancy Data", *Annals of Tourism Research*, Vol. 31, No. 2, pp. 374-392. doi: <http://dx.doi.org/10.1016/j.ijhm.2012.12.002>
- [16] Kolomiets, A., (2010), Seasonality in Tourism Employment Case: Grecotel Kos Imperial, Kos, Greece, Saima University of Applied Sciences Tourism and Hospitality, Imatra Degree Programme in Tourism Bachelor of Hospitality Management, Imatra
- [17] Krakover, S., (2000), Partitioning Seasonal Employment in the Hospitality Industry, *Tourism Management*, 21, 461-471. doi: [http://dx.doi.org/10.1016/S0261-5177\(99\)00101-6](http://dx.doi.org/10.1016/S0261-5177(99)00101-6)
- [18] Lundtrop, S., (2001), Measuring tourism seasonality, In *Seasonality in tourism*, Baum, T. and Lundtrop, S. str. 23-50, Oxford: Pergamon
- [19] Manning, R. E., Powers, L. A., (1984), Peak and off-peak use: Redistributing the outdoor recreation/tourism load, *Journal of Travel Research*, Vol. 23, str. 25-31.
- [20] McEnnif, J. (1992), Seasonality of Tourism Demand in the European Community, *Travel and Tourism Analyst*, Vol. 3, str. 67-88.
- [21] Ministry of Tourism, Republic of Croatia, *Tourism in figures*, Editions 2010.- 2016.
- [22] Murphy, P. E. (1985), *Tourism: a community approach*, Methuen, New York
- [23] Sutcliffe, C., Sinclair, M. (1980), The Measurement of Seasonality within the Tourist Industry: An Application to Tourist Arrivals in Spain, *Applied Economics*, Vol. 12, str. 429-441
- [24] Szivas, E., Riley, M., Airey, D. (2003), Labour mobility into tourism: attraction and satisfaction, *Annals of Tourism Research*, Vol. 30. No. 1, str. 64-76.
- [25] Volo, S., (2010), Seasonality in Sicilian tourism demand, Dipartimento di Metodi Quantitativi per le Scienze Umane, Università di Palermo, Italy
- [26] World Travel & Tourism Council (2017), *Travel and tourism economic impact 2017*
- [27] Yacoumis, J. (1980), Tackling seasonality: the case of Sri Lanka, *International Journal of Tourism Management*, Vol. 1, No. 4, str. 84-98. Doi: [http://dx.doi.org/10.1016/0143-2516\(80\)90031-6](http://dx.doi.org/10.1016/0143-2516(80)90031-6)