

## **Contribution to Environmental Communication: comparative analysis of two qualitative methods as the performance to European Union accession**

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### **Introduction:**

Metric to value accession to European Union of candidate and potential candidate countries is qualitative. In this paper media archive reports as participant science tool in comparison with and EC annual qualitative reports is presented.

### **Research Topic:**

Authors take in account review of existing participant science and citizens science tools ( ENVRIplus Report, 2016), where toolkit is basically collection of the best practices. Authors method is to apply recommendation steps for designing citizen science project (Eleta *et al.*, 2019), with assumption that stakeholder's engagement plan is based on citizens "delegating power" to journalists, in order to have higher degree of citizens power (Schrogel and Kolleck, 2018) and more powerful dissemination and transparency. In the other words "citizen science as scientific research employs" journalists as research assistants (Oerpe, 2013). Recent definition of citizen science as "a form of open collaboration in which members of the public participate voluntarily in the scientific process, engineering research or environmental monitoring in various ways" (ECE, 2021) fit to this approach.

Authors developed presented media archive participant science tool, considering that journalists/media are representing citizens (with common interests) and also survey is one of crowdsourcing tool, the core power of citizen science (Mihajlov, Mladenovic and Jovanovic,2020).

### **Research questions:**

Research question addressed in this paper is the possible contribution of presented qualitative analysis to environmental communication.

### **Results:**

Data used in this paper were gathered through the research on nexus media-environmental issues in Serbia. Starting from year 2011, data on number of articles with selected term in written media in Serbia are collected. To recall that traditional media use such as newspaper, magazine and radio are more closely related with civic engagement compared with TV (Xie, 2019), and that justify author's focus on written media.

National wide newspapers media archive exists from 2003, and since today have more than 2 million texts. Selected terms for this research are environmental related terms: environment/ecology (often in practice in local language terms environment and ecology are used with the meaning of environment), waste, recycling/recycling rate, landfill, biodegradable waste/ organic waste, chemicals, circular economy, climate change, Chapter 27 (Chapter 27 is environment and climate change issue in the process of Serbian accession to EU).

### **Questions for reflection:**

Presented results show potential of media archive reports as participant science tool in environmental communication.

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## ABSTRACT

By sharing experience, this paper justifies environmental communication through the media archive reports as participant science tool, considering that journalists/media are representing citizens (with common interests). It is shown that this tool can be useful in monitoring and development of public policies. Data used in this paper were gathered through the research on environmental issues in Serbia. Starting from year 2011, data on number of articles with selected term in written media in Serbia are collected. Proposed participant science tool is compared with the European Union qualitative tool towards country environmental sector progress in the process of accession. Outreach of comparison show that in timeline, when sector environment has better performance, it is bigger interest of citizens/journalists/media to environmental issues. Illustrative justification is provided that media archive reports could be used as participant science tool to supplement official observations and monitoring.

**Keywords:** Environmental communication, Environmental journalism, Media archive, Accession to European Union, Participant science, Serbia.

## INTRODUCTION

Environmental communication is subject of research and trends development (for example in Hansen, 2011). From the other angle, in scientific communities across all disciplines, terms: participative format (Schroegel and Kolleck, 2018), models for public participation (Schrink *et al.*, 2012 and Kimura and Kinchy, 2016), citizen science (Kimura and Kinchy, 2016 and Stratilova Urvalkova and Janouskova, 2019), public science, do-it-yourself-science, and more (Schroegel and Kolleck, 2018), citizen science projects (Eleta *et al.*, 2019 and Stratilova Urvalkova and Janouskova, 2019) are in use with not common accepted understanding and “no integrative tool to describe and compare different participatory approaches” (Schroegel and Kolleck, 2018). This paper focus is not review a number of citizen science definitions and principles (see Kimura and Kinchy 2016, Stratilova Urvalkova and Janouskova 2019, Riesch and Potter 2014, ECSA 2015, Bonney *et al.* 2009, Senabre, Ferran Ferrer and Perello 2018, ECSA 2020, Eitzel 2017, Auenbach *et al.* 2019) and/or to deal with the questions about the quality of findings or the quality of the process (Schroegel and Kolleck, 2018); issue of validation of “mobile technology” data, in-source and outsource (Saner, Yiu and Nguyen, 2020) and IT crowdsourcing tools. Until now in definition and scope approach do not consider subjective and objective possible approaches, like authors discussed within understanding of environmental security with subjective and objective risk (Curcic *et al.*, 2009).

Authors, in this paper, support the view that participant and citizens sciences are basically terms to describe approaches of public inclusion in different scientific fields (Schroegel and Kolleck, 2018), in this case in environment and climate change topics related communication. By participating media archive reports, authors are sharing experience, showing this approach as participant science tool, with possible role of media archive reports in monitoring and development of public policies.

## **METHODOLOGY**

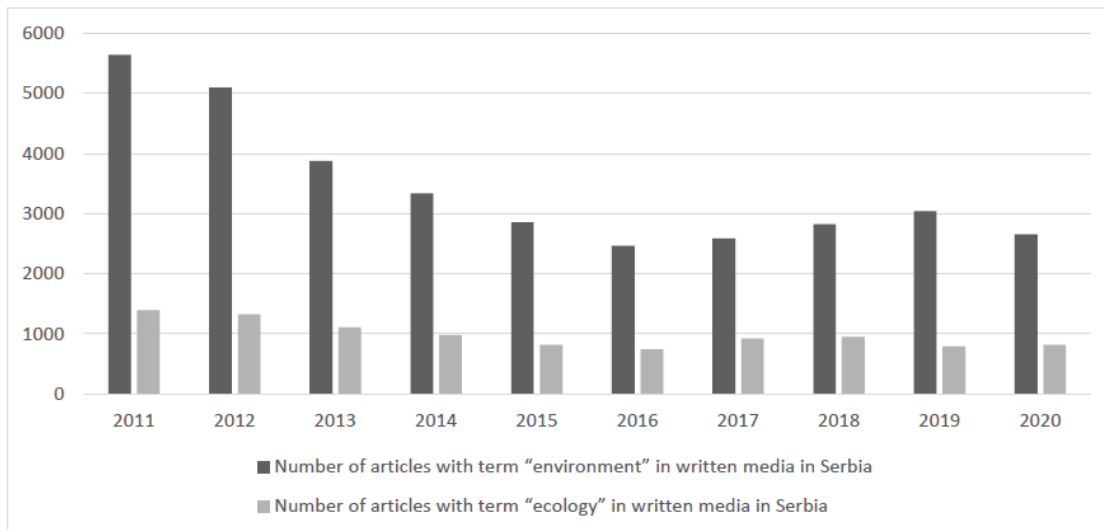
Participant science (and citizen science) is powerful approach for raising awareness on about environmental problems (Johnson *et al.*, 2014). Among identified different virtues claimed of citizen science (Kimura and Kinchy, 2016), applicable to this paper approach, are building community capacity for environmental protection, driving policy change and building more equal relationship between scientists and citizens. Investigation procedures for data “governance” (Eleta *et al.*, 2019) and implementation of participatory practices use various participatory models (Durant 1999, Lengwiler 2008, Schrogel and Kolleck 2018). With that approach, it could come that it is possible option to talk about “methods”/” procedures”/” models” in data gathering, then about “tools”. Authors take in account review of existing participant science and citizens science tools ( ENVRiplus Report, 2016), where toolkit is basically collection of the best practices. Authors method is to apply recommendation steps for designing citizen science project (Eleta *et al.*, 2019), with assumption that stakeholder’s engagement plan is based on citizens “delegating power” to journalists, in order to have higher degree of citizens power (Schrogel and Kolleck, 2018) and more powerful dissemination and transparency. In the other words “citizen science as scientific research employs” journalists as research assistants (Oerpe, 2013).

Authors developed this participant science tool, considering that journalists/media are representing citizens (with common interests) and also survey is one of crowdsourcing tool, the core power of citizen science (Mihajlov, Mladenovic and Jovanovic,2020). By this, authors are proposing the tool “to improve regularity of the observations” ( ENVRiplus Report, 2016), generating yearly and all through the year results.

## **RESULTS**

Data used in this paper were gathered through the research on nexus media-environmental issues in Serbia. Starting from year 2011, data on number of articles with selected term in written media in Serbia are collected. National wide newspapers media archive exists from 2003, and since today have more than 2 million texts. Selected terms for this research are environmental related terms: environment/ecology (often in practice in local language terms environment and ecology are used with the meaning of environment), waste, recycling/recycling rate, landfill, biodegradable waste/ organic waste, chemicals, circular economy, climate change, Chapter 27 (Chapter 27 is environment and climate change issue in the process of Serbian accession to EU).

Outreach results are presented in bellow (Figure 1, and Tables 1-7; data for circular economy are presented at Mihajlov, Mladenovic and Jovanovic, 2019 and 2021).



**Figure 1: Results for number of articles with term “environment/ecology” in written media in Serbia, per year**

**Table 2: Results for number of articles with term “waste” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
3169	2648	2040	1878	1673	1243	1421	1416	1559	1258

**Table 2: Results for number of articles with term “recycling/recycling rate” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1018	996	634	495	526	420	405	419	427	313
2	0	4	2	0	2	0	4	6	0

**Table 3: Results for number of articles with term “landfill” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1689	1312	981	1144	1050	759	1019	883	964	653



**Table 4: Results for number of articles with terms “biodegradable waste” and ‘organic waste” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0	0	0	0	0	0	0	0	12	0
29	23	21	10	7	8	19	20	24	27

**Table 5: Results for number of articles with term “chemicals” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
463	463	437	365	345	228	256	274	282	179

**Table 6: Results for number of articles with term “climate change” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
449	477	436	566	586	524	649	626	983	756

**Table 7: Results for number of articles with term “Chapter 27” in written media in Serbia, per year**

2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0	3	13	74	25	64	74	65	58	35

Figure 1, associated with data presented in Tables 1-7, show good illustration of environmental issues attention in Serbia. These results show potential of media archive reports as participant science tool in environmental communication; it is open area to discuss these results versus local circumstances of environmental sector in Serbia.

Applicable is analysis to what extend is media use associated with civic engagement (Xie, 2019), coming to proposal that “the use of traditional media for political information will have significantly positive influence on civic engagement”. This paper fit in that understanding, applying to environmental, not to political information. This paper also accommodate conclusion “news-media use is closely and positively associated with the quality of opinions and participatory activities” ( Kim, Wyatt and Katz, 1999). Traditional media use such as newspaper, magazine and

radio are more closely related with civic engagement compared with TV (Xie, 2019), and that justify author’s focus on written media.

Results presented show that “such participant science can produce data that could be included in reviews but should be understood as opportunity for co-development of a country’s strategy and hence should be seen as complementary but not subservient to the review process”, by accommodation findings of participation-based and inclusive monitoring as an integral part of managing the SDGs implementation process at country’s level (Saner, Yiu and Nguyen,2020).

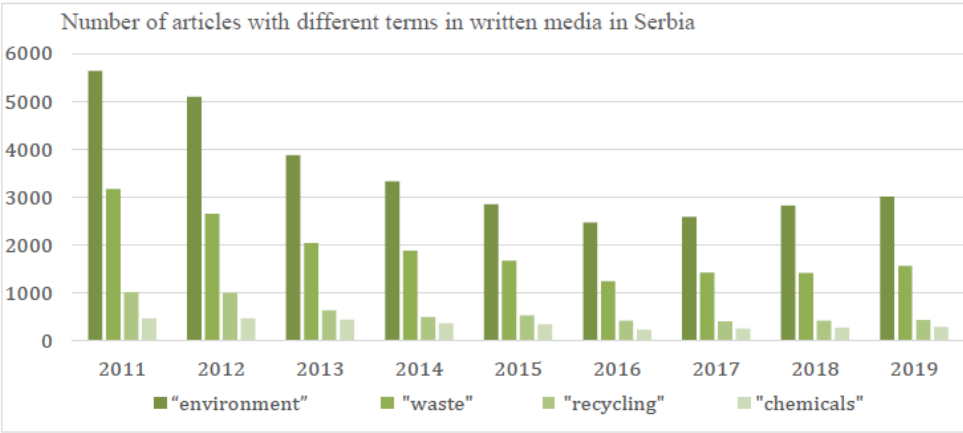
Having in mind that “citizen science is not yet recognized by the EU as an effective method to monitor the success of European Union Directives”(ECSA 2016 and EC White Paper 2015), authors are in addition choosing to verify proposed participant science tool as the qualitative tool towards country environmental performance, having in mind that “policy makers and activists have to be realistic and use the existing practical tools to gather the real time data required to monitor progress and mitigate gaps” (Saner, Yiu and Nguyen,2020). In that regards, European Commission each year takes stock of the situation in the candidate countries and potential candidates and issue the Progress Reports/Reports in which the Commission services present their detailed assessment of the state of play in each related country, what has been achieved over the last year, and set out guidelines on reform priorities (EC Progress Reports). In this reporting, this paper focus is sector environment, with starting point at European Commission Report on the readiness of Serbia and Montenegro to negotiate a Stabilization and Association Agreement with the EU (Feasibility Study).

**Table 8: European Commission assessment of sector environment for Serbia (narrative, qualitative), per year**

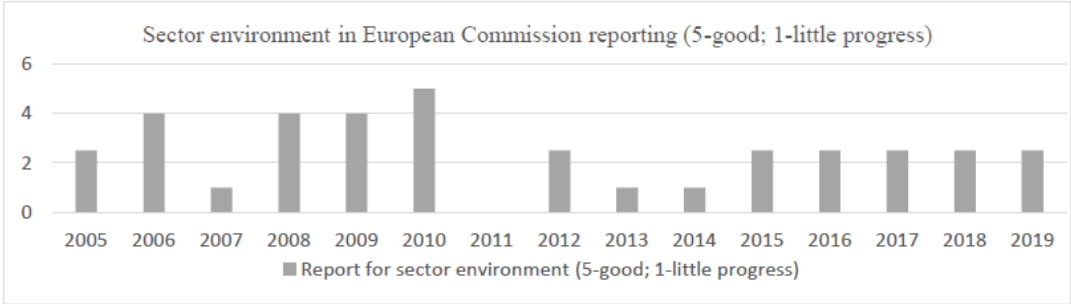
(2002-2004) <sup>14</sup>	ambitious programs
2005	Some limited progress
2006	Moderately advanced
2007	Little progress
2008	Moderately advanced
2009	Moderately advanced
2010	Good progress
2011	n/a
2012	Some progress
2013	Little progress
2014	Little progress
2015	Some progress
2016	Some progress
2017	Limited progress
2018	Some progress
2019	Limited progress
2020	Limited progress

<sup>14</sup> European Commission Report on the readiness of Serbia and Montenegro to negotiate a Stabilization and Association Agreement with the EU (Feasibility Study), noted, among other, that Serbian Agency for Environment is established and started cooperation with European Environmental Agency, and “the establishment of ambitious legislative programs in the field of environmental protection was mainly managed by the Ministry of Protection of Natural Resources and Environment of Serbia, established in 2002”.

When compare, Table 8 results corresponds in the trends with Figure 2. For the purpose of visual comparison Table 8 data are also presented as Figure 3, with assumption to transform European Commission narrative to numeric values: good progress -5, moderately advanced-4, limited progress/some progress/ some limited progress – 2.5, little progress -1.



**Figure 2: Comparison of trends for sector environment in Serbia**



**Figure 3: European Commission Progress Reports/Reports on environment (and climate change) sector in Serbia towards EU accession**

Comparison is given as illustrative justification that media archive reports could be used as participative tool to supplement official observation and monitoring, showing agreement and/or gaps in opinion by different stakeholders. The Figures show the same trends of citizens/journalist’s attention to environment and environmental performance and progress in Serbia. In the other words, in timeline, when sector environment has better performance, it is bigger interest of citizens/journalists/media to environmental issues.

## **CONCLUSIONS**

Having in mind that many classifications of citizen science projects exist, as well as models for public participation in scientific research, this paper not review a number of citizen (and participant) science definitions and principles and/or deal with the questions about the quality of findings or the quality of the process. In this paper, the view that participant science is basically terms to describe approaches of public inclusion in environment and climate change topics communication, is applied. Participant science tool, is presented, with assumptions that journalists/media are representing citizens (with common interests) and also that survey is one of crowdsourcing tool. It is considered that citizens delegating power to journalists, in order to have higher degree of citizens power and more powerful dissemination and transparency.

In the case of Serbia, illustrative justification that media archive reports could be used as participative tool to supplement official observation and monitoring, is presented, showing that the same trends of citizens/journalist's attention to environment and environmental performance and progress (in the European Union accession process) in Serbia. In timeline, when sector environment has better performance, it is bigger interest of citizens/journalists/media to environmental issues. Presented results show potential of media archive reports as participant science tool in environmental communication.

Finally, this study can be a solid basis for comparison for future research in the area of study.

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